AVIDYNE

EX500/EX600
Multi-Function Display

Release 3 and Later
Installation Manual
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This document is applicable to Software Part Numbers:

- 530-00193-000, EX500 Release 3 Software
- 530-00193-020, EX500 Release 4 Software
- 530-00201-800, EX500 Release 4.1 Software
- 530-00201-900, EX600 Release 4.1 Software

This document is applicable to Hardware Part Numbers:

- 700-00007-(), EX500
- 700-00167-(), EX600

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IMPORTANT NOTICE

Avidyne STC No. SA00161BO (EX500, P/N 700-0007-()) is only applicable to the 14 CFR Part 23 Class I, II, and III aircraft, as defined in Advisory Circular AC 23 1309-1C, which are listed in the AML.

When installed in Class III aircraft, if the EX500 replaces a Radar display, an independent lightning detection and display system complying with TSO-C110a must be installed for operations in IMC, and an FAA-approved Flight Manual Supplement, Document 600-00083-001 Rev (A) or later FAA-approved revision, is required and must be carried aboard the aircraft during all flights.

Installations in 14 CFR Part 23 Class IV, Part 25, Part 27, and Part 29 aircraft are not authorized under this STC.

IMPORTANT NOTICE

Avidyne STC No. SA00290BO (EX600, P/N 700-00167-()) is only applicable to the 14 CFR Part 23 Class I, II, and III aircraft, as defined in Advisory Circular AC 23 1309-1C, which are listed in the AML.

When installed in Class III aircraft, if the EX600 replaces a Radar display, an independent lightning detection and display system complying with TSO-C110a must be installed for operations in IMC, and an FAA-approved Flight Manual Supplement, Document 600-00246-000 Rev 00 or later FAA-approved revision, is required and must be carried aboard the aircraft during all flights.

Installations in 14 CFR Part 23 Class IV, Part 25, Part 27, and Part 29 aircraft are not authorized under this STC.

AVIDYNE FlightMax™

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1 About the EX500/EX600 MFD

The Avidyne Multi-Function Display, or MFD, is a single unit computer system mounted in an aircraft instrument panel in the pilot's view that interfaces to various aircraft avionics. The MFD increases pilot situational awareness and enhances flight safety by providing supplementary navigation, traffic, terrain, airspace, weather, and approach chart information.

This manual contains information about the physical, mechanical, electrical characteristics, and installation instructions for the Avidyne FlightMax EX500 and EX600-Series Multi-Function Displays (MFDs), Part Numbers 700-00007-001 through -006, -701 through -706, -801 through-806, and -901 through -906, along with 700-00167-001 through -006, -011 through -016, and -905 through -906 containing Software Part Number 530-00193-000, -200, 530-00201-800, -900.

Note: For information about earlier releases of the EX500, see the EX500-Series Installation Manual P/N 600-00079-000.

The EX500/EX600 MFDs are intended for use as a supplementary situational awareness device. The EX500/EX600 contains software developed in accordance with RTCA/DO-178B Level D requirements.

This section contains the following information:

- Section 1.1, “Standard Functionality” on page 1
- Section 1.2, “Optional Functionality” on page 1

A complete FlightMax EX500/EX600-Series Multi-Function Display system consists of the following components:

- Avidyne FlightMax EX500/EX600-Series Multi-Function Display (MFD).
- Fixed-Wing OR Helicopter system installation kit, including MFD assembly and necessary connectors.
- User documentation including *Pilot's Guide*, *Installation Manual*, and *Instructions for Continued Airworthiness*.

1.1 Standard Functionality

MFD standard functionality available on the EX500/EX600:

- A GPS interface to provide position, velocity, and flight plan data to the MFD.
- The MFD displays the current aircraft position and active flight plan graphically overlaid on the moving map comprised of terrain, geo-political boundaries, airspace, navaids, airports, airways, and obstacles.
- The MFD displays the current active flight plan in textual format.

1.2 Optional Functionality

The following features are optional for the EX500/EX600:

- **External traffic detection system**—Allows the MFD to display a pictorial representation of nearby transponder-equipped aircraft overlaid on the moving map display.

- **External lightning detection system**—Allows the MFD to present a visual display of lightning strikes or cells overlaid on the moving map display.
- **Two-Way Datalink transceiver**—Allows the MFD to display strategic weather and airspace information in graphical and textual formats. Supports either:
  - External MLX770 Iridium Datalink Transceiver

Note: EX500 Release 4 or greater software is required to support the MLX770 Iridium Datalink Transceiver. All Iridium or MLX770 references in this document assume Release 4 or greater software is installed in the EX500.

  - Built-in ORBCOMM Datalink Transceiver

Note: EX500/EX600 Release 4.1 or greater software does not support the ORBCOMM Datalink Transceiver. All references to the ORBCOMM Datalink Transceiver only apply to EX500 Software 530-00193-020 and earlier.

- **External Broadcast Datalink receiver**—Allows the MFD to display strategic weather and airspace information in graphical and textual formats. When used with Two-Way Datalink, the MultiLink feature can be enabled and used.
- **External Terrain Awareness and Warning System (TAWS)**—Allows the MFD to display EGPWS terrain image data on a TAWS page.
- **Terminal and Procedure Chart Data (CMax™ Charts)**—Optional charts available from Jeppesen Sanderson, Inc. provide terminal and procedure charts at the touch of a button.
- **External Digital or Analog Radar Receiver/Transmitter**—Allows the MFD to display radar image data on a radar page or overlaid on the moving map display.

2 General Information

This section contains the following information:

- Section 2.1, “Equipment Description” on page 3
- Section 2.2, “MFD Technical Specifications” on page 4
- Section 2.3, “Configuration Options” on page 5

➥ To obtain maximum performance from the MFD, follow the installation instructions carefully.

MFD operating information is contained in the *EX500/EX600 Multi-Function Display Pilot's Guide*, which is supplied with the MFD.

➥ Avidyne strongly recommends that you review the *Pilot’s Guide* before operating the MFD.

The current version of the *EX500/EX600 Multi-Function Display Pilot's Guide* is available on the web at www.avidyne.com.

Note: The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in aircraft. The article may be installed only if the installation is performed in accordance with Part 43 or the applicable airworthiness requirements.

Warning: AC 20-68B, Recommended Radiation Safety, sets forth recommended radiation safety precautions to be taken by personnel when operating airborne weather radar on the ground. Dangers from ground operation of airborne weather radar include the possibility of human body damage and ignition of combustible material by radiated energy. The full text of this FAA Advisory Circular may be found on the web at http://faa.gov/RegulatoryAdvisory/ac_index.htm.

2.1 Equipment Description

A complete FlightMax EX500/EX600-Series Multi-Function Display system consists of the following components:

- EX500/EX600 Multi-Function Display (MFD), with standard and optional interfaces.
- System installation kit including MFD tray assembly, and necessary connectors.
- Optional radar interface cables connecting the MFD to the radar receiver/transmitter. These cables provide a simplified connection to the pre-existing wiring.
- Zip Drive Dataloader (250MB), connector cable, and Zip Disk, or for Release 3 and later, a USB Flash Memory Drive. For more information about loading data for Release 3 and later, see the Avidyne *Data Update Guide* (Document number 600-00148-000).
- User documentation, including the *EX500/EX600 MFD Pilot's Guide* and *Installation Manual* (optional).

2.2 MFD Technical Specifications

Table 1: EX500 Technical Specifications

Standard Features		
Display	High Brightness Sunlight Readable Color AMLCD	
Diagonal size	5.5 inches	
Interfaces	RS-232, ARINC 429, ARINC 453, ARINC 407 & TTL	
Physical Characteristics		
Weight with tray	With Quake SC:	7.2 lbs
	Without Quake SC:	6.8 lbs
Height	4.35 inches (Face Plate)	
Width	6.25 inches (Face Plate)	
Depth	12.8 inches (Tray incl. Rear connectors)	
Viewing Angle	Vertical:	+30°, -10°
	Horizontal:	60° left and right of center
Operating Limits		
Voltage	18-32 VDC, negative ground	
Current	Maximum: 5 A at 28V	
See Appendix A: *Environmental Qualification Forms*, on page 83 for Environmental Qualification Form		

Table 2: EX600 Technical Specifications

Standard Features		
Display	High Brightness Sunlight Readable Color Transflective LCD	
Diagonal size	5.78 inches	
Interfaces	RS-232, ARINC 429, ARINC 453, ARINC 407 & TTL	
Physical Characteristics		
Weight with tray	With Fixed Wing Tray:	6.2 lbs
	With Helicopter Tray:	9.2 lbs
Height	4.93 inches (Face Plate Front), 4.21 inches (Rear)	
Width	6.25 inches (Face Plate)	
Depth	12.79 inches (Tray incl. Rear connectors)	
Viewing Angle	Vertical:	+30°, -10°
	Horizontal:	60° left and right of center
Operating Limits		
Voltage	18-32 VDC, negative ground	
Current	Maximum: 3 A at 28V	
See Appendix A: *Environmental Qualification Forms*, on page 83 for Environmental Qualification Form		

2.3 Configuration Options

To support the many sensor types encountered in the typical aircraft installation, the installer must configure the EX500/EX600 for the sensor type and select the correct port configuration. Table 3 lists sensor options and their associated port configurations. This data may be used when executing Maintenance Mode sensor setup utilities. Port selection must match the aircraft wiring. Default port assignments must match the wiring diagrams shown in Appendix F: *EX500/EX600 General Wiring*, on page 95 through Appendix J.8 *WXR250/270/300 RADAR w/Adaptor Cable Wiring*, on page 107.

When the MFD is used in conjunction with a digital radar system, ARINC 429 TX port 3 and ARINC 453 RX port 1 are default settings, which are not selectable via the procedures contained in this document. Table 4, “Main Connector (P2) Pin Assignments,” on page 7 provides a cross reference between port assignments and functional use.

The selected ports are displayed on the Port Info Page, described in Section 6.1, “System Info Pages” on page 69

Table 3: Sensor Port Configuration Options

Sensor Type	Sensor Option	Port Type	Default Port	System Type	Port Config.
GPS/FMS	GAMA 429 Format	ARINC 429	1	Garmin GPS 155XL, GNC 300XL	Speed: Low
			1	Garmin GPS 400/500	Speed: Low
			1	Garmin GNC 420	Speed: Low
			1	Garmin GNS 430/530 (including 430W/530W) (GAMA 429 Graphics w/INT)	Speed: Low
			1	Bendix/King GNS-XLS	Speed: Low
			1	Bendix/King KLN-90B	Speed: High
			1	Universal UNS-1B	Speed: High
	King/Aviation Format	RS-232	1	Bendix/King GNS-XLS	Baud: 9600
			⁄	Bendix/King KLN-89B	Baud: 9600
				Bendix/King KLN-90B	Baud: 9600
			1	Bendix/King KLN-94	Baud: 9600
			1	Garmin GNS 430/530	Baud: 9600
			1	Garmin GNS 480	Baud: 9600
			1	Trimble 2000, 2101	Baud: 9600
			1	UPSAT – all GPS units	Baud: 9600
	Northstar Format	RS-232	1	Northstar M3	Baud: 9600
	NMEA 0183 Format	RS-232	1	Garmin 150/250	Baud: 4800

Table 3: Sensor Port Configuration Options (Continued)

Sensor Type	Sensor Option	Port Type	Default Port	System Type	Port Config.
Traffic	*Not Installed*	—	—	—	—
	RS-232 Devices	RS-232	2	■ Avidyne TAS600 Series ■ Avidyne TCAD 9900BX ■ Avidyne TCAD 9900B	—
	TAS	ARINC429	2	■ Avidyne TAS600 Series ■ Avidyne TCAD 9900BX ■ L3 Skywatch, Skywatch ■ Bendix/King KTA-870, KMH-880	—
	TIS-G		2	Garmin GTX330	—
	TCAS		2	Goodrich TCAS 791	—
			2	Bendix/King CAS-66A, KTA-970	—
Broadcast Datalink	*Not Installed*		—		—
	Avidyne MLB700 (to Sirius satellite network)	RS-232		Avidyne MLB700	—
	XM WX Datalink Receiver	RS-232	4	Heads Up Technologies, XMD076	—
Two-Way Datalink	*Not Installed*				—
	Iridium	RS-232		Avidyne MLX770	—
	ORBCOMM	RS-232		Avidyne ORBCOMM SC (EX500 only)	—
Lightning	*Not Installed*	—	—	—	—
	TWX670	RS-232	3	Avidyne TWX670	—
	WX-500	RS-232	3	L3 WX500	—
Radar	The radar port is factory configured and requires no setup.				
TAWS	*Not Installed*	—	—	—	—
	Honeywell EGPWS	ARINC 429	4	Honeywell EGPWS	—
		ARINC 453	2		
Map Heading {Source}	GPS/FMS	ARINC 429	—	Multiple manufacturers	—
	Traffic	ARINC 429		Multiple manufacturers	
	Stormscope	ARINC 429		L3 Stormscope	
	Avidyne EXP5000 PFD	RS 232/ ARINC 429		Avidyne	
	None (use GPS Track)	RS 232/ ARINC 429		Multiple manufacturers	

Table 4: Main Connector (P2) Pin Assignments

Pin	Function	Suggested	Your Setup
1	TTL1 (R/T ON)		
2	RESERVED		
3	RESERVED		
4	GND		
5	ARINC 429 RX1 A	GPS A	
6	ARINC 429 TX2 A		
7	TTL2 (TAS)		
8	ARINC 429 RX3 A		
9	ARINC 429 TX4 A	TAWS	
10	RS232 TX1		
11	RS232 RX1	GPS A	
12	RS232 RTN1	GPS A	
13	RESERVED		
14	RESERVED		
15	GND		
16	SYNCHRO X IN		
17	SYNCHRO REF LO		
18	DIMMING		
19	RESERVED		
20	GND		
21	RESERVED		
22	RESERVED		
23	RESERVED		
24	RESERVED		
25	ARINC 429 RX1 B	GPS A	
26	ARINC 429 TX2 B		
27	RESERVED		
28	ARINC 429 RX3 B		
29	ARINC 429 TX4 B	TAWS	
30	RS232 TX2	TCAD	
31	RS232 RX2	TCAD	
32	RS232 RTN2	TCAD	
33	SYNCHRO VALID		
34	RESERVED		

Pin	Function	Suggested	Your Setup
40	28 VDC		
41	28 VDC		
42	28 VDC		
43	ARINC 429 TX1 A		
44	RESERVED		
45	ARINC 429 RX2 A	TRAFFIC	
46	ARINC 429 TX3 A	RADAR	
47	TTL3 (TAS)		
48	ARINC 429 RX4 A		
49	RS232 TX3	Lightning sensor	
50	RS232 RX3	Lightning sensor	
51	RS232 RTN3	Lightning sensor	
52	RESERVED		
53	RESERVED		
54	SYNCHRO Z IN		
55	ARINC 453 TX3 A	(UNUSED)	
56	ARINC 453 RX2 A	TAWS	
57	GND		
58	ARINC 453 TX3 B	(UNUSED)	
59	ARINC 453 RX2 B	TAWS	
60	PWR GND		
61	PWR GND		
62	PWR GND		
63	ARINC 429 TX1 B		
64	RESERVED		
65	ARINC 429 RX2 B	TRAFFIC	
66	ARINC 429 TX3 B	RADAR	
67	RESERVED		
68	ARINC 429 RX4 B		
69	RS232 TX4	Broadcast Datalink, MLX770, or GPS B	
70	RS232 RX4	Broadcast Datalink, MLX770, or GPS B	
71	RS232 RTN4	Broadcast Datalink MLX770, or GPS B	
72	RESERVED		
73	RESERVED		

Table 4: Main Connector (P2) Pin Assignments (Continued)

Pin	Function	Suggested	Your Setup
35	SYNCHRO Y IN		
36	GND		
37	GND		
38	RESERVED		
39	RESERVED		

Pin	Function	Suggested	Your Setup
74	SYNCHRO REF HI		
75	ARINC 453 RX1 A	RADAR	
76	RESERVED		
77	RESERVED		
78	ARINC 453 RX1 B	RADAR	

Table 5: ARINC Port Pinout Cross-Reference

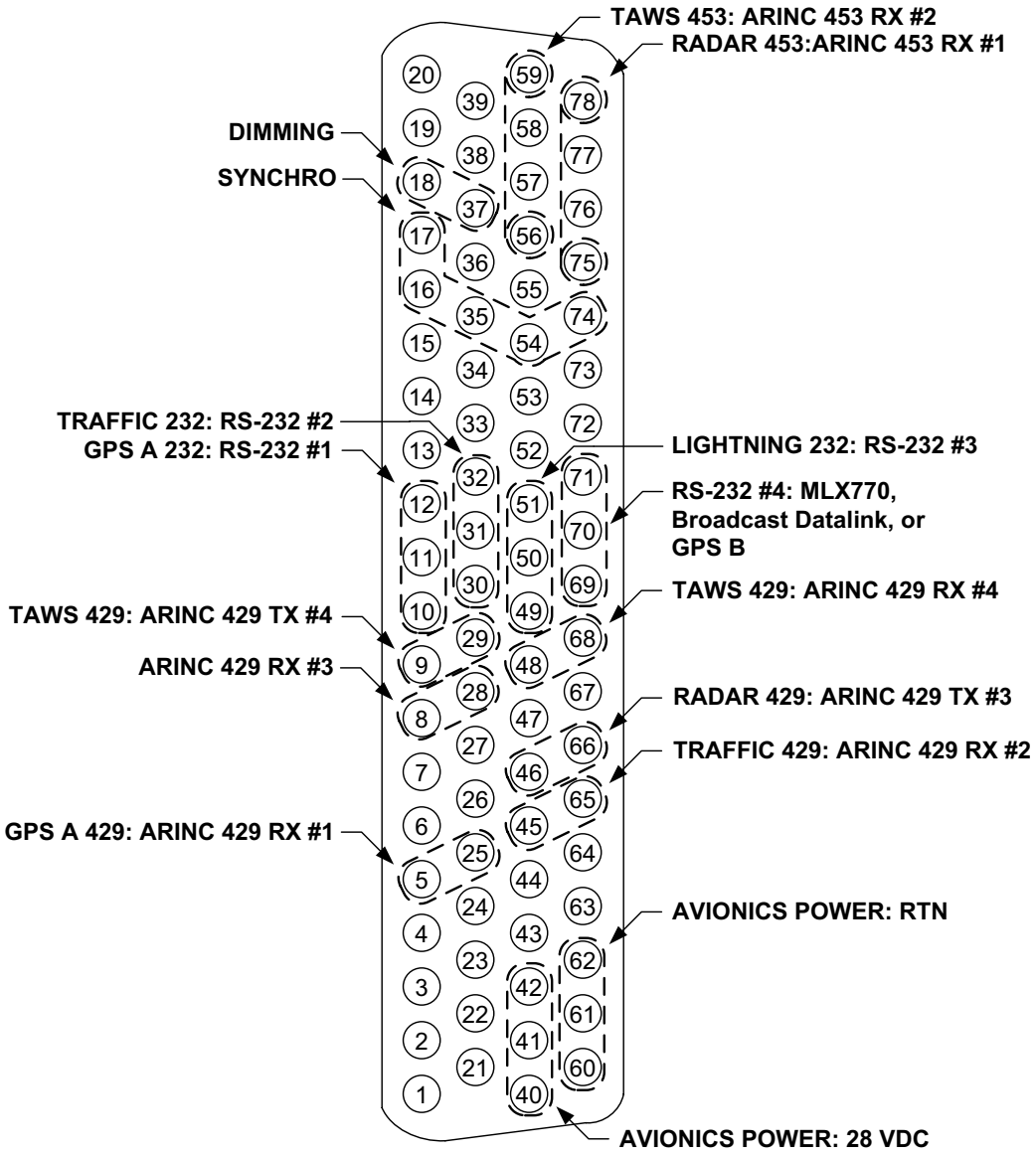
ARINC 429 Ports			
Port	Signal	Suggested Pin	Your Setup
1	TX A	43	
	TX B	63	
	RX A	5	
	RX B	25	
2	TX A	6	
	TX B	26	
	RX A	45	
	RX B	65	
3	TX A	46	
	TX B	66	
	RX A	8	
	RX B	28	
4	TX A	9	
	TX B	29	
	RX A	48	
	RX B	68	

ARINC 453 Ports			
Port	Signal	Suggested Pin	Your Setup
1	TX A	N/A	
	TX B	N/A	
	RX A	75	
	RX B	78	
2	TX A	N/A	
	TX B	N/A	
	RX A	56	
	RX B	59	
3	TX A	55	
	TX B	58	

Table 6: RS-232 Port Pinout Cross-Reference

RS-232 Ports			
Port	**Signal**	**Pin**	**Your Setup**
1	TX	10	
	RX	11	
	RTN	12	
2	TX	30	
	RX	31	
	RTN	32	
3	TX	49	
	RX	50	
	RTN	51	
4	TX	69	
	RX	70	
	RTN	71	

Note that the connector assignments are suggested, but not required. If you use different pin assignments, be sure to document the changes.


TAWS 453: ARINC 453 RX #2
RADAR 453:ARINC 453 RX #1
DIMMING
SYNCHRO
TRAFFIC 232: RS-232 #2
GPS A 232: RS-232 #1
LIGHTNING 232: RS-232 #3
RS-232 #4: MLX770, Broadcast Datalink, or GPS B
TAWS 429: ARINC 429 TX #4
TAWS 429: ARINC 429 RX #4
ARINC 429 RX #3
RADAR 429: ARINC 429 TX #3
TRAFFIC 429: ARINC 429 RX #2
GPS A 429: ARINC 429 RX #1
AVIONICS POWER: RTN
AVIONICS POWER: 28 VDC

P2 - MAIN CONNECTOR
SERIAL DATA PORT
ASSIGNMENTS

NOTES:
1. AVAILABLE FOR GPS B WHEN TRAFFIC 429: ARINC 429 RX #2 PORT IS NOT WIRED
2. AVAILABLE FOR GPS B WHEN TAWS 429: ARINC 429 TX #4 PORT IS NOT WIRED

Figure 1: Main Connector Sample Port Assignments

3 Unpacking the MFD

The shipping carton for the FlightMax EX500, Avidyne P/N 850-00010-XXX contains one of the following configurations:

Table 7: EX500 Part Numbers

Part Number	Qty	Black w/ Quake SC	Grey no Quake SC	Black, no Quake SC	Grey w/ Quake SC	Description
700-00007-()	1	-001	-701	-801	-901	EX500, no RADAR
		-002	-702	-802	-902	EX500, RDR1100/1200 (RT-131A*, RT-1201A1*)
		-003	-703	-803	-903	EX500, RDR1300 (RT-1301A1*)
		-004	-704	-804	-904	EX500, RDR 130/150 (RT-131A) RDR 160 (ART-161A†)
		-005	-705	-805	-905	EX500, RDS8X, RDR2XXX (RS-18X, RS-8XX, ART-2XXX)
		-006	-706	-806	-906	EX500, WXR270/270A (WXT-250A, WXT-250B)
600-00078-000 600-00078-001	1	*FlightMax EX500-Series MFD Pilot's Guide.- Pre-Release 4, or EX500/EX600 MFD Pilot's Guide.- Release 4 or Later*				

**. With DA-1203A antenna*

†. With one of the following antennas: AT-133A, DA-144A, AT-133A inverted, DA-144A inverted

The shipping carton for the EX600, Avidyne P/N 850-00208-XXX contains one of the following configurations:

Table 8: EX600 Part Numbers

Part Number	Qty	Black	Grey	Description
700-00167-()	1	-001	-011	EX600, no RADAR
		-002	-012	EX600, RDR1100/1200 (RT-131A*, RT-1201A1*)
		-003	-013	EX600, RDR1300 (RT-1301A1*)
		-004	-014	EX600, RDR 130/150 (RT-131A) RDR 160 (ART-161A†)
		-005	-015	EX600, RDS8X, RDR2XXX (RS-18X, RS-8XX, ART-2XXX)
		-006	-016	EX600, WXR270/270A (WXT-250A, WXT-250B)
600-00078-001	1	*EX500/EX600 MFD Pilot's Guide.- Release 4 or Later*		

**. With DA-1203A antenna*

†. With one of the following antennas: AT-133A, DA-144A, AT-133A inverted, DA-144A inverted

Note: When unpacking or servicing the EX500/EX600, do not lay the MFD down on its face. This can break the knobs and render the MFD unusable.

Locate the labels on the bottom of the MFD. Verify that the MFD includes the ordered feature option set marked on the label.

The shipping carton of the FlightMax EX500 Installation Kit, Avidyne P/N 850-00011-000 contains the following components:

Part Number	Qty	Description
700-00009-000	1	EX500 Tray Assembly
030-00181-000	1	Connector, D-Sub 78F, w/ backshell & Pins
150-00100-000	8	Screw, 4-40 x ¼ Flat, SS, 100 Degree
600-00004-000	1	EX500 Installation Documentation CD

The shipping carton of the EX600 Fixed-Wing Installation Kit, Avidyne P/N 800-00039-000 contains the following components:

Part Number	Qty	Description
700-00168-000	1	EX600 Fixed Wing Tray Assembly
030-00181-000	1	Connector, D-Sub 78F, w/ backshell & Pins
150-00100-000	8	Screw, 4-40 x ¼ Flat, SS, 100 Degree
600-00011-000	1	EX600 Installation Documentation CD

The shipping carton of the EX600 Helicopter Installation Kit, Avidyne P/N 800-00039-001 contains the following components:

Part Number	Qty	Description
700-00168-001	1	EX600 Helicopter Tray Assembly
030-00181-000	1	Connector, D-Sub 78F, w/ backshell & Pins
150-00100-000	8	Screw, 4-40 x ¼ Flat, SS, 100 Degree
600-00011-000	1	EX600 Installation Documentation CD

➥ Ensure that all the parts were received and sustained no shipping damage.

If damage occurs during shipping, the damaged shipping carton and packing material will help substantiate your claim to the shipping company. Retain the original shipping carton and packing material in case you need to ship the unit for service.

Do not open the MFD cover in any manner and do not remove the internal CompactFlash memory card, unless the operation is being conducted by authorized personnel using an approved Avidyne Service Bulletin. Otherwise, the CompactFlash memory or MFD may be damaged.

4 Installation Planning

This section contains information for installing and wiring the MFD. All installation procedures should follow the acceptable practices, methods, and techniques of avionics installations as described in FAA Advisory Circulars. Use appropriate appendices for guidance with MFD dimensions and panel cutout requirements.

Installations not identified in applicable STCs may require additional substantiation. See Appendix C: *STC Permissions*, on page 85 for information pertaining to STCs. Referring to an STC may assist in securing installation approval.

4.1 Location and Viewing Angle

The EX500/EX600 is designed for panel mounting using the mounting tray supplied with the unit installation kit. Locate the MFD in a position on the panel where the pilot can easily reach the knobs and controls to operate and view it from the proper viewing angle.

Viewing Angle Limits	
Vertical	Up 30º, Down 10º [+30º/-10º]
Horizontal	Left and Right 60º [± 60º]

4.2 TSO-C157 Requirements

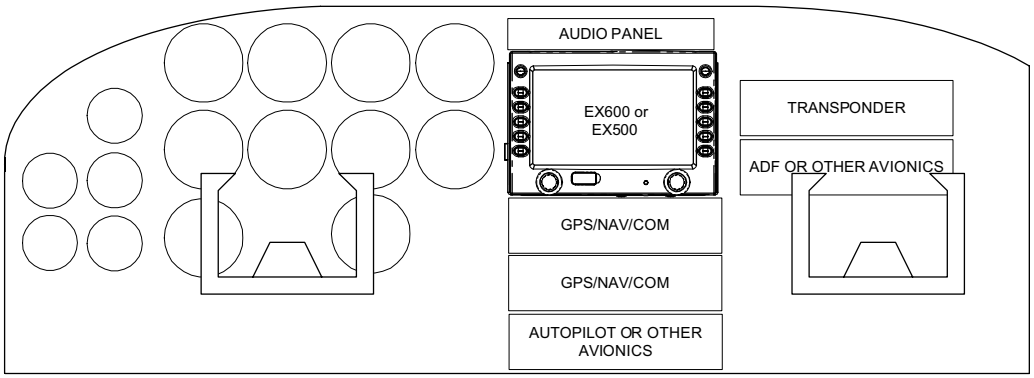
The FIS-B (Flight Information Services-Broadcast) equipment installer needs to assess FIS-B equipment integration with other avionics and airborne applications, such as integration of FIS-B display products with display of terrain, proximate aircraft traffic information, flight plan overlays, moving map displays, etc.

Manufacturers, installers, and applicants must assess identification of display integration issues, and their potential impact upon FIS-B equipment design and developmental assurance, during equipment installation. For example, FIS-B equipment may share common avionics display resources hosting multiple applications. Evaluate here, the installation for hazards contributed by FIS-B equipment malfunction that may cause loss or malfunction of other aircraft applications.

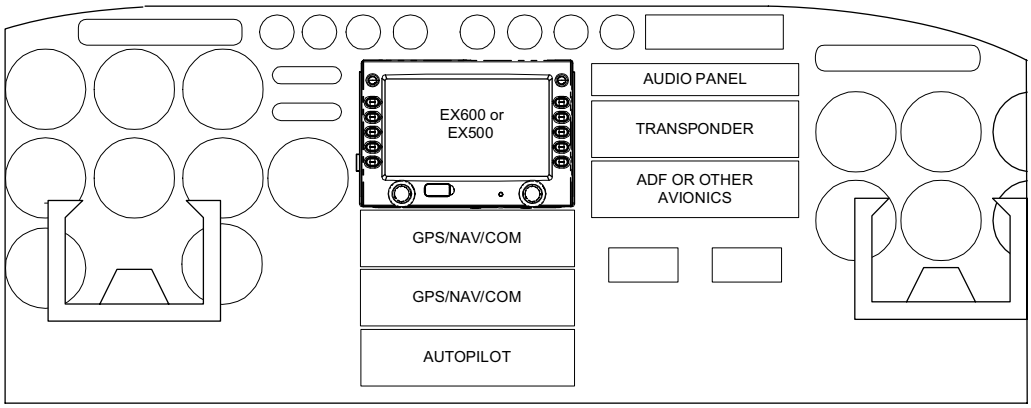
Limited display resource computing capability will require the installer to review display resource priority schemes to ensure FIS-B equipment does not preclude, corrupt, or delay display of applications necessary for the continued safe flight of the aircraft. Installers must assess the incompatible use of common color coding philosophies and symbology.

4.3 Class III Aircraft Installations

When installed in a Class III aircraft, the EX500 and EX600 STCs require an independent lightning detection and display system complying with TSO-C110a to be installed and operational for flights in IMC. Additionally, an FAA-approved Flight Manual Supplement is required and must be carried aboard the aircraft during all flights.



MFD PLACEMENT IN PANEL OF SMALLER AIRCRAFT (TYPICAL)



MFD PLACEMENT IN PANEL OF LARGER AIRCRAFT (TYPICAL)

Figure 2: Sample EX500/EX600 Panel Placements

4.4 Cooling Requirements

The EX500/EX600 includes internal cooling provisions to maximize operational reliability.

➥ Make sure that the air vents located at the rear and sides of the unit/tray assembly are not obstructed.

4.5 Positioning and Mounting the EX500/EX600 Tray

The unique requirements of your aircraft will determine the specifics of the installation, as shown in Figure 2. However, make sure that you install the EX500/EX600 with the following clearances:

- Leave four inches (4”) of clearance behind the tray to allow for connector clearance and permit air circulation through the EX500/EX600.
- Leave a minimum of 1/8” clearance between the tray and other avionics for air circulation purposes.
- The Avidyne mounting trays provide for a 0.125" clearance between the bezel and mounting tray (along the sides and top of the tray) to allow for any panel thickness.

When you install the EX500/EX600 tray, ensure that the mounting tray is installed at the proper depth in the panel to allow the connectors of the EX500/EX600 to fully seat in the connectors of the mounting tray. When properly installed, the EX500/EX600 bezel will contact the protruding lip on the bottom of the tray.

Make sure that the structural aspects of the installation are performed in accordance with AC43.13-2A, Chapter 1. See D.8 *EX500 Tray Support Structure Panel*, on page 93 for details on tray mounting and support.

Caution: It is extremely important that the 0.125” panel thickness is not exceeded, or the EX500/EX600 may not fully seat in the mounting tray. If communication between the EX500/EX600 and any of the sensor interfaces is not established, ensure that the EX500/EX600 is fully seated in the tray, and then check all sensor connections.

When other avionics are installed with the EX500/EX600, ensure that the installation does not result in a deflection of the aircraft magnetic compass of greater than 10 degrees.

Note: Once the tray is mounted in place, you can install or remove the connectors and the back plate. To remove the back plate, unscrew the six screws that hold it in place.

4.6 Electrical and Sensor Interfaces

28-volt DC electrical power must be supplied to the MFD. In aircraft with a 28-volt system, the MFD is usually connected to a non-essential avionics bus. Non-28-volt systems can use a regulated +28 VDC converter. The MFD may be wired to the aircraft dimming bus to control front panel LED brightness via the cockpit panel brightness control.

See Figure 34, “EX500/EX600 General Wiring,” on page 95 through Figure 46, “WXR250/270/300 RADAR w/ Adaptor Cable Wiring,” on page 107 for system and sensor wiring diagrams. Perform all wiring in accordance with the FAA Advisory Circular AC 43.13-1B.

The following connectors, or their equivalents, support the EX500/EX600 tray installation.

Designation	Vendor	Part Number	Description
P1	Positronic	DD44M10G00	44-Pin High Density Male D-Sub Connector
P2	Positronic	DD78F10G00	78-Pin High Density Female D-Sub Connector
J2	Delta Electronics	4205-018-N995	50 Ohm Blind Plug BNC Connector (EX500 ORBCOMM only)

4.6.1 Electrical and Sensor Interface Wiring Notes

The following notes apply to the aircraft wiring used to install the EX500/EX600:

1. **Power**—P2- input: 5 A (EX500), 3 A (EX600) @ 28 vdc.
   - Use 20 AWG for lengths greater than 3ft.
   - Use 22 AWG for P2 high-density sockets.
   - 7.5 amp circuit breaker is recommended for the EX500.
   - 5 amp circuit breaker is recommended for the EX600.

- For 14 vdc A/C, use 14 to 28 vdc converter (KGS Electronics RB-125, Ameri-King AK550-6 or similar with TSO-C71, output 5 A (EX500), 3 A (EX600) min. @ 28 vdc.)

2. **Dimming**—P2- input: use 22 AWG, connect to a/c instrument dimming bus. Supports any range 0-28 vdc. Connection to dimming-bus ground reference required.
3. **ARINC 429**—P2- wire: use 22 AWG twisted shielded pair, MS22759/18-22-2 or equivalent. Connect shield to P2 connector metallic backshell grounding screw with solder or crimp ring terminal.
4. **ARINC 453**—P2- wire: use 22 AWG twisted double shielded pair (Quadrax), (Bendix/King p/n 024-00064-0000) or equivalent. Connect outer shield to P2 connector metallic backshell grounding screw with solder or crimp terminal ring. Connect inner and outer shield to sensor connector metallic backshell grounding screw with solder or crimp terminal ring.
5. **RS-232**—P2- wire: use 22 AWG shielded triple, MS22759/18-22-3 or equivalent. Connect a dedicated RS-232 signal ground from the sensor to the MFD. Connect shield to P2 connector metallic backshell grounding screw with solder or crimp ring terminal.
6. **Synchro input**—P2- wire:
   - Use 22 AWG shielded double, MS22759/18-22-2 or equivalent, for REF HI and REF LO.
   - Use 22 AWG shielded triple, MS27500/18-22-3 or equivalent, for X/Y/Z.
   - Connect shield to P2 connector metallic backshell grounding screw with solder or crimp ring terminal.
7. **Synchro Valid**—Use 22 AWG shielded single, MS22759/18-22-1 or equivalent. Valid low is less than 1.4 vdc. Valid high is greater than 2.7vdc.

Note: The Synchro Valid input is optional. If you do not use it, no connection is required. See Section 5.10.2, “Broadcast Datalink Setup” on page 61 for configuration details.

8. **ORBCOMM Two-Way Datalink antenna (EX500 Only)**—J2- coax cable: use M17/128-RG400, (Thermax/CDT p/n RGS-400) high temperature, 50 ohm, stranded core with 0.038 o.d., or equivalent. Terminate antenna end with BNC series connector. See mechanical installation notes.
9. **Analog radar**—P1- control and data lines:
   - Use 22 AWG shielded single, MS22759/18-22-1 or equivalent, for trigger and data lines.
   - Use 22 AWG for all others. For the specific radar system, see the appropriate wiring diagram in Appendix J: *Radar Wiring*, on page 100.
10. **Shield terminations**—Place the shield terminations as close to the protected signal wire terminations as feasible.

4.6.2 Electrical Load Analysis

Prior to installation, perform an electrical load analysis on the aircraft in accordance with AC 43.13-1B, Chapter 11. Use the following values to support the analysis:

- **28 VDC Nominal Load**—2 A
- **28 VDC Maximum Load**—5 A (EX500), 3 A (EX600)

Ensure that the power input to the EX500/EX600 is circuit-protected in accordance with the guidelines of AC 43.13-1B, Chapter 11, Section 2.

➥ A 7.5 amp circuit breaker is recommended for use with the EX500.

➥ A 5 amp circuit breaker is recommended for use with the EX600.

4.6.3 Weight and Balance Calculation

A Weight and Balance calculation aircraft is required as part of installation approval process. Follow the guidelines as established in AC 43.13-1B, Chapter 10, Section 2. Use the unit and installation kit materials weight as follows:

- **EX500 With Quake SC: 7.2 lb. (3.3 kg)**—EX500 MFD with tray and connectors
- **EX500 Without Quake SC: 6.8 lb. (3.1 kg)**—EX500 MFD with tray and connectors
- **EX600 With Fixed-Wing Tray: 6.2 lb. (2.81 kg)**—EX600 MFD with fixed-wing tray and connectors
- **EX600 With Helicopter Tray: 9.2 lb. (4.17 kg)**—EX600 MFD with helicopter tray and connectors

4.7 Selecting the Heading Source

The EX500/EX600 can receive aircraft heading from a variety of sources. Heading source options are:

Table 9: Heading Source Options

Source	System	Interface
Synchro		ARINC 407 Synchro
Lightning	WX-500	RS-232
Traffic	Skywatch	ARINC 429
	Skywatch HP	ARINC 429
	KTA-870	ARINC 429
	KMH-880	ARINC 429
	TCAS I	ARINC 429

Source	System	Interface
GPS/FMS	GNC300XL	ARINC 429
	GPS 400/500	ARINC 429
	GNS 430/530	ARINC 429
	KLN-90B	ARINC 429
	UNS-1B	ARINC 429
	GNS-XLS	ARINC 429
PFD	Avidyne EXP5000	ARINC 429 or RS-232

Note: If an Avidyne PFD is not installed, the Synchro option yields the best system reliability (availability)**.** Heading information supplied by the other systems is typically sourced from the synchro and may require interface converters between the synchro and the alternate heading source. See the manufacturer's installation manuals for guidance.

If any of the alternate sources fail, you will lose heading related functionality on the EX500/EX600. Specifically, this results in the loss of traffic and RADAR overlay capability as well as forcing North Up display of the Map Page.

See Section 5.11, "Map Heading Source Setup" on page 64 and Figure 34, "EX500/EX600 General Wiring," on page 95 for more information about selecting the active heading source.

4.8 Datalink Antenna Installation Considerations

The EX500/EX600 supports the following 2-Way Datalink installations:

- MLX770 Iridium Datalink transceiver
- Built-in ORBCOMM Datalink transceiver (EX500 Release 4.0 and earlier only)

For information on MLX770 installation, refer to the *MLX770 Datalink Transceiver Installation Manual* (600-00204-000).

The ORBCOMM 2-Way Datalink system is designed to work with a VHF antenna covering the band from 137 MHz to 151Mhz. If an existing comm antenna is in the preferred location for a datalink antenna, consider using the Avidyne DC50 Datalink Coupler and replacing the existing comm antenna with a combined VHF/datalink antenna. Please contact Avidyne for details.

The EX500/EX600 also supports Broadcast weather data, which provides more weather data in a more timely fashion. Avidyne supports two Broadcast Weather suppliers:

- XM WX Satellite Weather, using the XMD076 XM WX Receiver from Heads Up Technologies.
- WSI Weather, using the Avidyne MLB700.

The Broadcast Datalink system operates in the S-band at 2.3 GHz.

The EX500/EX600 can operate with both Datalink systems simultaneously. With both 2-Way Datalink and Broadcast Datalink systems installed, the MFD can provide Avidyne's unique MultiLink features, which include text messaging, flight tracking, and enhanced weather coverage.

4.8.1 ORBCOMM Antenna Details (EX500 Release 4.0 and earlier only)

To improve ORBCOMM reception performance and minimize potential damage to the ORBCOMM transceiver, an antenna design with a DC-short between the antenna center conductor and shield termination is required. The following commercially available antennas are acceptable:

Table 10: Suggested Two-Way Datalink Antennas

Manufacturer	P/N	Application
Comant	CI 177-4	Max 210 kts indicated at 10,000 ft.
	CI 248-30	Max 210 kts indicated at 10,000 ft.
	CI 108-1	Max 600 kts TAS at 35,000 ft.
	CI 211-1	Max 600 kts TAS at 35,000 ft.
Sensor Systems	S65-8280-10	Max 600 kts TAS

➥ Refer to manufacturers for detailed performance specifications and aircraft applicability

- Mount the ORBCOMM antenna on the aircraft top-side, as high on the fuselage as practical.
- Mount the antenna no closer than 36 inches to other transmitters. You may need to relocate other, less location-sensitive transmitters, to achieve optimal datalink performance.
- On radar-equipped aircraft, mount the antenna as far aft as possible, but no closer than 36 inches from vertical obstructions (such as the vertical stabilizer). Reflected radar energy may cause damage to the datalink transceiver.

  Install the radar in accordance with the applicable portions of AC 43.13 and the antenna manufacturer's instructions. For more information, see Figure 33, "Installing the 2-Way Datalink Antenna," on page 94.

This Installation Manual does not contain approved data for type-specific aircraft antenna installations.

4.8.2 Broadcast Antenna Details

- Mount the antenna no closer than 36 inches to VHF-Comm transmitters of 15 Watts or less. For more powerful transmitting antennas, ensure a minimum separation of 48 inches.
- If you are installing an XM/VHF-Comm combo antenna to replace an existing approved antenna installation, the existing separations are acceptable. SATCOM antennas transmit at 40 Watts and should be separated by the largest distance possible. This distance must be a minimum of 36 inches.
- When routing the broadcast antenna cable, try to achieve the maximum possible separation from transmitter antenna feed cables, especially with SATCOM and other high power transmitters. VHF transmitter antenna feed cables of 15 Watts or less require only a minimal separation.
- Receive-only antennas such as GPS and ADF do not produce interference and require little separation. To allow for separation from transmitters, you can place the XM antenna as close as possible to these types of antennas.
- For further details, including installation pre-testing, see the Broadcast Receiver's installation manual.

4.9 Wiring External Devices

4.9.1 GPS and FMS Wiring

GPS data may be received via a GAMA 429 Graphics interface with intersections or an RS-232 interface. See the appropriate wiring diagram and the specific installation instructions for your particular GPS. For more information, see Section 5.7, “Traffic Sensor Setup” on page 40.

Note: For the EX500/EX600, Avidyne recommends using a GAMA 429 Graphics connection with intersections for FMS/ GPS. The GAMA 429 Graphics input can contain heading data, necessary for overlay capabilities as well as approach procedures and the display of curved segments. For more information, see Section 5.5.1, “GAMA 429 Graphics Setup” on page 31.

4.9.2 Dual GPS Setup with GAMA 429

The EX500/EX600 can receive information from two GAMA 429 Graphics capable GPS units. Connect the GPS according to the wiring diagram in Appendix G: *GPS/FMS System Wiring*, on page 96.

Select a different ARINC port for GPS 2.

4.9.3 Broadcast Datalink Receiver Wiring

See the wiring diagram in Appendix H: *Lightning and Datalink Sensor Wiring*, on page 97 and the *HeadsUp XMD076 Installation Manual*. Connect the RS-232 port of the Datalink receiver to any of the available RS-232 ports of the MFD as shown. (RS232 #4 is the default assignment, but not mandatory.) Use shielded wiring, terminated at each end to chassis ground. Contact Heads Up Technologies at www.heads-up.com for information on the *HeadsUp XMD076 Broadcast Datalink Receiver.* Contact Avidyne for information on the MLB700 Multilink Broadcast Receiver.

4.9.4 Lightning Sensor Wiring

See the wiring diagram in Appendix H: *Lightning and Datalink Sensor Wiring*, on page 97 and the *WX-500 Installation Manual* or the T*WX670 Installation Manual*. Connect the RS-232 port of the lightning sensor to any of the available RS-232 ports of the MFD as shown. Use shielded wiring, terminated at each end to chassis ground. Connect the lightning sensor jumpers for correct stabilization source and antenna position. These settings will also be set in the MFD and must agree.

Caution: It is extremely important that you perform noise mapping and ensure that the proper grounds have been installed and checked after the Lightning interface is installed. Ensure that the lightning sensor is installed and set up according to its installation instructions. Excessive noise can produce erroneous lightning strike indications.

4.9.5 Traffic Sensor Wiring

The MFD supports a number of different traffic sensors. Be sure to follow the instructions for the specific traffic sensor installed on the aircraft.

- **TAS** (L-3 SkyWatch: SKY497, TRC497 and TRC899)—Connect data and TTL control lines and configure as shown in Appendix I: *Traffic Sensor Wiring*, on page 98. Use shielded wiring and terminate as shown.

Note: If using a TRC 497, ensure the software revision is 1.6 or later.

- **TAS/IHAS/Avidyne Traffic** (Avidyne TAS600 Series, 9900B, 9900BX, Bendix/King: KTA 870)—For Avidyne products, connect aircraft power to the Avidyne TCAD sensor as described in the Avidyne *TAS600 Series Installation Manual.* For other products, see the appropriate installation documentation. Connect data lines and configure as shown in Appendix I: *Traffic Sensor Wiring*, on page 98. Use shielded wiring and terminate as shown.

Note: Ensure the 9900BX software revision is 1.07 or later.

- **TIS-G** (Garmin: GTX-330, GTX-330D)—Ensure the Garmin software revision is 3.03 or higher. Connect data lines and configure as shown in Appendix I: *Traffic Sensor Wiring*, on page 98. Use shielded wiring and terminate as shown.

  Wire power to the Garmin GTX -330 transponder as directed in the *Garmin Installation Manual*.

Note: The MFD does not provide power to the GTX sensor. TIS uses an ARINC 429 data connection between the transponder and the MFD. Make this connection after consulting the wiring diagrams in the appendix of this document and the GTX-330 installation manual.

4.9.6 TAWS Wiring

(Honeywell: KGP 560) – Ensure the KGP 560 has part number 965-1198-005. Connect as shown in I.2 *Traffic/TAWS Sensors Wiring*, on page 99.

The EGPWS software must support KC Picture Bus (KCPB) Phase 2. See the Honeywell EGPWS documentation for applicable software configurations. If the EGPWS interface is operating properly, there will be no system status messages.

4.9.7 Map Configuration

Wiring for Map can be done in a number of different ways, depending on the aircraft configuration and options.

Configuring Map Heading from the EXP5000 PFD

The EX500/EX600 can receive heading directly from an installed Avidyne EXP5000 PFD via an ARINC 429 or an RS-232 bus.

For the correct interconnection between the EXP5000 PFD and the EX500/EX600, see Table 35, “GPS/FMS Sub-System Wiring,” on page 96.

Configuring Map Heading from a GPS/FMS

The MFD can receive heading from an GPS/FMS via an ARINC 429 bus. The source of heading is usually a gyro transmitting synchro or stepper to SkyWatch or StormScope sensor connected to the GPS/FMS, as shown in Figure 3.

See Appendix G: *GPS/FMS System Wiring*, on page 96 for the correct pinouts to the MFD.

When checking the GPS/FMS connection to the EX500/EX600, the GPS/FMS must have a valid position fix (latitude/longitude).

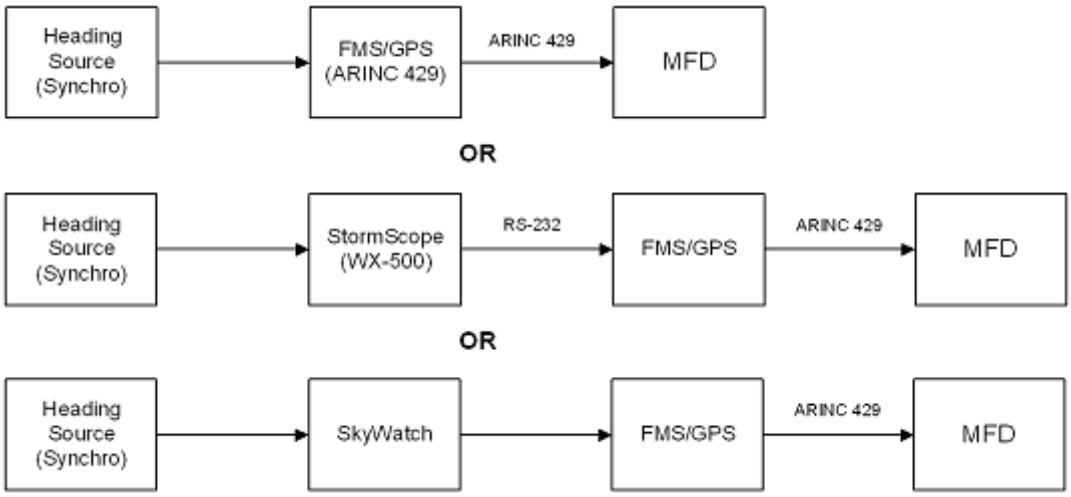


Figure 3: Heading Configuration with GPS/FMS

Configuring Map Heading from StormScope

The MFD is capable of receiving heading data from the WX-500 StormScope via RS-232. Configure the MFD as shown in Figure 4:

Figure 4: Heading Configuration with StormScope

Configuring Map Heading from TAS (Traffic)

The EX500/EX600 is capable of receiving heading data from a TAS system. Configure the MFD as shown in Figure 5. See Appendix I: *Traffic Sensor Wiring*, on page 98 for the correct pinouts to the MFD.

Figure 5: Heading Configuration with SkyWatch

Configuring Map Heading from a Heading Source using the Synchro Interface

The EX500/EX600 is capable of receiving heading data directly from a heading source using the Synchro interface as shown in Figure 6. The Synchro pins on the MFD are identified in Table 4 and Figure 1. Also see Figure 34, "EX500/EX600 General Wiring," on page 95 for Synchro connection information.

Figure 6: Connecting Heading Source through Synchro Interface

4.9.8 Radar Sensor Wiring

See Appendix J: *Radar Wiring*, on page 100 for the appropriate wiring diagram.

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5 MFD Feature Setup and Checkout

This section contains the following information:

- Section 5.1, “Preliminary Test” on page 25.
- Section 5.2, “Optional MFD Function Activation Utility” on page 26
- Section 5.3, “Using the Configuration Save and Restore (CSR) Utility” on page 26
- Section 5.4, “Using the Maintenance Mode Page” on page 27
- Section 5.5, “GPS/FMS Navigators Setup” on page 30
- Section 5.6, “Lightning Sensor Setup” on page 35
- Section 5.7, “Traffic Sensor Setup” on page 40
- Section 5.8, “TAWS Setup (Optional)” on page 44
- Section 5.9, “Radar Sensor Setup” on page 46
- Section 5.10, “Aircraft Setup” on page 59
- Section 5.11, “Map Heading Source Setup” on page 64

5.1 Preliminary Test

➤ Power up the MFD for post installation evaluation and configuration. To do so:

1. Turn on the MFD by applying power to the aircraft electrical bus supplying the MFD.

Note: Read the *EX500/EX600 Multi-Function Display Pilot’s Guide* for explanations of various functions.

2. The green LED control lights behind all the front panel controls should light up.

3. After the initial power up, the software will load and go through several checks. During this startup sequence the screen displays the text “Initializing-Please Wait...”.

4. The startup sequence is finished when the “Press any bezel key to Continue...” message displays.

5.2 Optional MFD Function Activation Utility

Avidyne provides the ability to install CMax using an activation utility on CompactFlash. This section describes the installation procedure for this utility. With Release 4.1 and later MFDs, CMax is included and activated at the factory so this procedure is not necessary.

➥ The CMax Activation Utility is available for use only by avionics repair facilities performing MFD installations, MFD software upgrades, and MFD function activation on installed MFD software.

➤ To activate CMax, obtain the **MFD CMax Activation Utility** which activates the MFD CMax™ function. This utility is for use in FAA-approved aircraft repair stations only.

The CompactFlash version of the CMax Utility will run each time that you use it. However, if run on an MFD on which CMax is already activated, it will de-activate CMax. In that instance, running the utility yet again will re-activate CMax. If you activate the CMax utility on an MFD, the CMax Activation Utility will not let you activate CMax on any other MFD. Only one license is permitted per CompactFlash.

Follow the instructions in the accompanying service bulletin the CMax Activation Utility.

5.3 Using the Configuration Save and Restore (CSR) Utility

➥ The Configuration Save and Restore Utility is not used when doing field-loadable software upgrades. It also cannot be used for transitioning from an EX500 MFD to an EX600 MFD.

When performing an upgrade to an existing MFD, you may want to use the Configuration Save and Restore (CSR) Utility. This utility allows you to save off many of the configuration options that had previously been set on the MFD, including:

- Any added-cost utilities such as CMax (as described in Section 5.2, “Optional MFD Function Activation Utility” on page 26).
- Lightning, Traffic, GPS, and MAP parameters.

The CSR Utility can save you many hours of work and a CSR Utility CompactFlash should be included as part of the ship kit for MFD Upgrades.

For detailed information about the CSR Utility, see the Avidyne Service Bulletin *EX500 Save & Restore Utility*, Document Number 601-00007-035.

5.4 Using the Maintenance Mode Page

The MFD Maintenance Mode Page contains the setup pages for each function.

➤ To start using the Maintenance Mode Page, apply power to all the sensors that interface with the MFD, including the GPS, the Lightning and Traffic sensors, and TAWS sensor.

5.4.1 Entering Maintenance Mode

To enter the Maintenance Mode Page, apply power to all the sensors that interface with the EX500/ EX600, including the GPS, the Lightning and Traffic sensors, and TAWS sensor.

1. Set the aircraft avionics master ON and circuit breaker IN
2. Press PWR to turn on the EX500/EX600

   The system will begin its normal start up sequence
3. At the prompt, “Press any bezel key to continue”, press any button.
4. Rotate the Page knob clockwise until the Aux Page displays.
5. Simultaneously press and hold buttons L1 (top left) and L3 (3rd down on the left) (see Figure 7) for at least 5 seconds.

   The Maintenance Mode Page displays. Note that the available setup options depend on the specific aircraft.

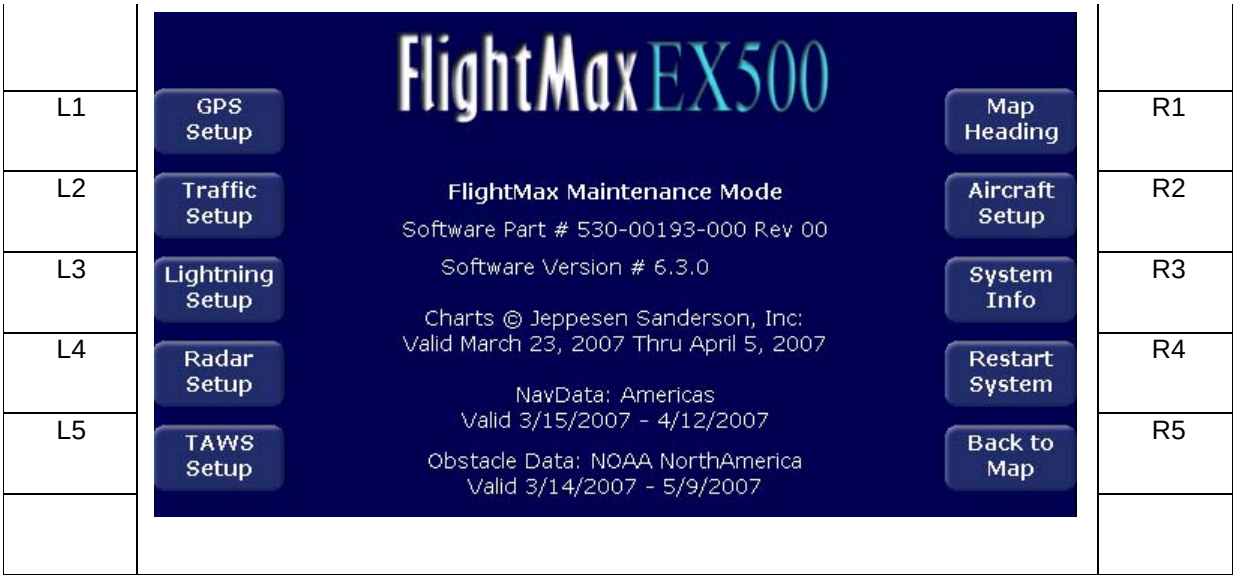


Figure 7: Example Maintenance Mode Page

6. Record the software part number, and verify that it is compatible with the hardware part number, in accordance with the table below.

Table 11: Hardware and Software Part Numbers

Hardware Part Number	Software Part Number	Nomenclature
700-00007-X01	530-00193-000 530-00193-020 530-00201-800	EX500
700-00007-X02	530-00193-000 530-00193-020 530-00201-800	EX500, RDR1100/1200
700-00007-X03	530-00193-000 530-00193-020 530-00201-800	EX500, RDR1300
700-00007-X04	530-00193-000 530-00193-020 530-00201-800	EX500, RDR130/150/160
700-00007-X05	530-00193-000 530-00193-020 530-00201-800	EX500, RDS8X, RDR2XXX
700-00007-X06	530-00193-000 530-00193-020 530-00201-800	EX500, WXR250/275/300
700-00007-999	530-00134-000 530-00134-001 530-00201-899	EX500, RDS8X, RDR2XXX, DEALER DEMO
700-00167-0X1	530-00201-900	EX600
700-00167-0X2	530-00201-900	EX600, RDR1100/1200
700-00167-0X3	530-00201-900	EX600, RDR1300
700-00167-0X4	530-00201-900	EX600, RDR130/150/160
700-00167-0X5	530-00201-900	EX600, RDS8X, RDR2XXX
700-00167-0X6	530-00201-900	EX600, WXR250/275/300
700-00167-905	530-00201-999	EX600, RDS8X, RDR2XXX, DEALER DEMO
700-00167-906	530-00201-999	EX600, WXR250/275/300, DEALER DEMO

5.4.2 Working in Maintenance Mode

As shown in Figure 7, the Maintenance Mode Page contains setup buttons for the available EX500/ EX600 features. When you select a Setup feature, the appropriate page displays. From the Setup page, the following options will always be available:

- **Select Knob**—Rotate to change the highlighted parameter box.
- **Change Knob**—Rotate to select a parameter to modify from the highlighted box.
- **Save**—Store any setup changes made since entering the page and return to the Maintenance Mode Main page.
- **Cancel**—Return to the Maintenance Mode Main page without saving your changes

➤ When working in Maintenance Mode:

1. After making changes to each setup page press *Save* to save your changes and return to the main menu.

To exit without saving your changes, press *Cancel*.

2. Changes in the setup pages do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

➥ Avidyne suggests that you restart the system after you make changes to each setup page.

If no changes were made, press *Back to Map* to exit Maintenance Mode.

5.5 GPS/FMS Navigators Setup

The MFD can interface with several types of GPS/FMS systems. Table 12 lists the GPS/FMS systems that can be used with the MFD, along with information about data formats and GPS configurations.

Table 12: GPS/FMS Manufacturer's Matrix

GPS/FMS	RS-232	ARINC 429	Baud/ Data Rate	Heading Output	Configuration Notes	DME ARC
KLN-89B//94	Yes	No	RS232 – 9600	No	—	Flight Plan ends at entry point
KLN-90B	Yes	Yes	RS232 – 9600 ARINC – Low	ARINC only	—	Flight Plan ends at entry point
NorthStar M1, M2, or M3*	Yes	No	1200 or 9600	No	The Northstar default baud rate is 1200. For better performance and extended data, set the baud rate to 9600. See the NorthStar manual to change the baud rate.	—
Trimble 2000, 2101	Yes	Some models	9600	No	Use RS-232 port 2 No Parity, 8 bits.	Sends multiple waypoints around arc
Garmin 150, 250	Yes	150- No 250-No	RS232 – 9600 ARINC – Low	ARINC only	■ For the 250 use the EFIS mode (not W/O GAMA mode). ■ If using the NMEA format use the 2nd channel.	—
Garmin 155, 165	Yes	No	9600	No	—	—
Garmin 400/500 Series (including 430W/530W)	Yes	Yes	RS232 – 9600 ARINC – Low	ARINC only	■ For RS-232, set the Garmin to Aviation Output. ■ With ARINC 429, use GAMA Graphics with Intersections	With ARINC 429 only. With RS-232 the arc is depicted as a straight line
Garmin 480	Yes	No	RS232 -9600	No	■ Do not use Arinc 429	—
Universal UNS-1B	No	Yes	ARINC – High	Yes	—	—
Bendix/King GNS-XLS	No	Yes	ARINC – High or Low	Yes	Configure as follows: ■ GAMA ARINC 329 Bus Data Set= 1. ■ Basic EFIS DME Arc Style=1 ■ Arc as Gap	The arc is depicted as a gap
Morrow Apollo GX-50	Yes	No	9600	No	Use the Moving Map format.	—

**. NorthStar GPS/FMS systems use NorthStar RS-232 format. All other RS-232-capable GPS/FMS use King/Aviation format.*

Note: Use the matrix as a general guideline only. GPS manufacturers are constantly changing their products. Always refer to the Installation Manuals that come with the GPS/FMS to confirm configuration and setup parameters. Additionally, keep in mind that not all GPS configurations can be used with all aircraft.

There are two interface configurations that the MFD uses to connect with the GPS:

- GAMA 429 with Intersections
- RS-232

EX500/EX600 MFDs support both GAMA 429 and RS-232. However, GAMA 429 Graphics with intersections is the only configuration from the GPS capable of providing heading information if the GPS is being used as the heading source (see Section 5.11, “Map Heading Source Setup” on page 64 for a complete explanation on setting up the various heading configurations within the MFD).

5.5.1 GAMA 429 Graphics Setup

If your GPS is capable of output from GAMA 429 Graphics with intersections, use the wiring diagram in Appendix G: *GPS/FMS System Wiring*, on page 96 when installing the MFD.

Note: Using a 429 graphics output allows for the display of curved flight segments and approach data, if that data is available.

➤ To setup a GAMA 429-capable GPS:

1. From the Maintenance Mode Page, press *GPS Setup*. The GPS Setup Page displays:

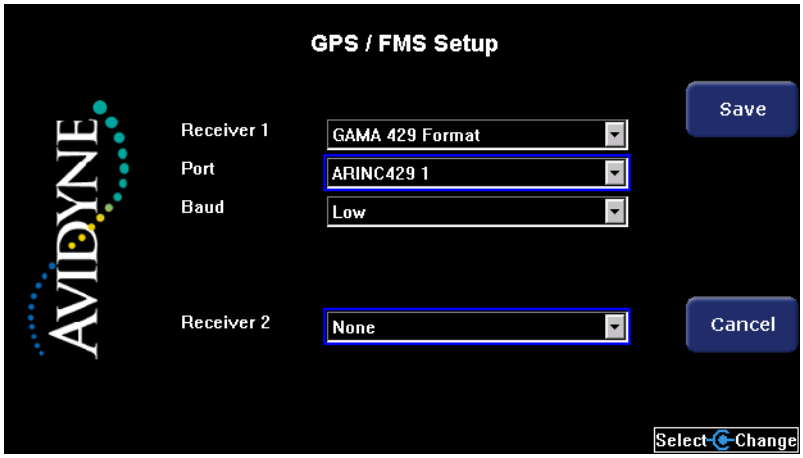


Figure 8: GPS Setup, GAMA 429

2. Configure the following:

- **Receiver**—Select GAMA 429 Graphics Format.
- **Port—** Select ARINC1.

Note: Selecting Port=None indicates that a GPS is not connected to the MFD. In this case, the MFD software does not expect GPS input.

- **Speed—**There are two speeds available, High and Low. See Table 12, “GPS/FMS Manufacturer’s Matrix,” on page 30 to determine the correct speed for your system.

3. When you are done, press *Save* to save your changes. Press *Cancel* to exit without saving changes.
4. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.5.2 Dual GPS Setup with GAMA 429

The EX500/EX600 can receive information from two GAMA 429 Graphics capable GPS units. Connect the GPS according to the wiring diagram in Appendix G: *GPS/FMS System Wiring*, on page 96, using a different ARINC port for GPS2. Follow the setup instructions in Section 5.5.1.

5.5.3 RS-232 Setup

If your GPS uses an RS-232 configuration, use Appendix G: *GPS/FMS System Wiring*, on page 96 for wiring information.

Note: An RS-232 interface does not provide for heading data from the GPS/FMS.

➤ To set up the MFD for the RS-232 Interface:

1. From the Maintenance Mode Page, press *GPS Setup*. The GPS Setup Page displays.
2. Configure the interface as follows:
   - **Receiver—**Select the receiver-type for your GPS/FMS system. Determine the RS-232 output format using Table 12, “GPS/FMS Manufacturer’s Matrix,” on page 30 or your GPS/FMS Installation manual. Select one of the following RS-232 formats:
     - NMEA 0183
     - King/Aviation Format
     - Northstar Format
   - **Port—**Select RS232 1, or as wired.
   - **Baud—**Select the highest-possible baud rate for your GPS/FMS system. See the appropriate GPS/FMS Installation manual or see Table 12, “GPS/FMS Manufacturer’s Matrix,” on page 30 to determine for the maximum speed.

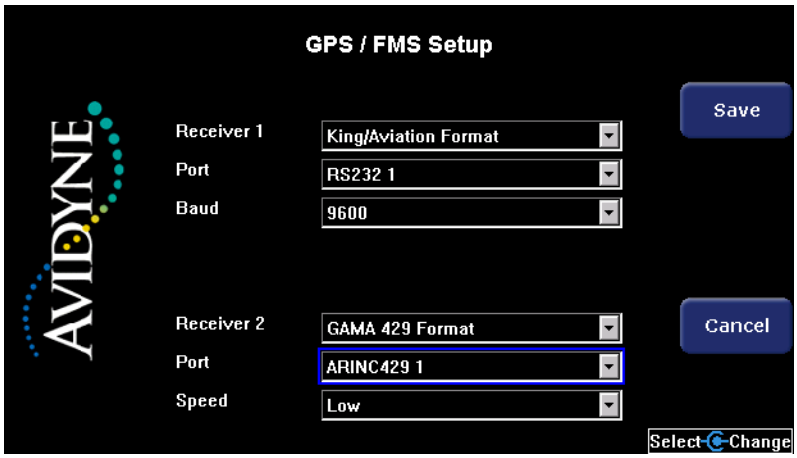


Figure 9: Dual GPS Setup

3. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
4. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.5.4 Dual GPS Setup with RS-232

The MFD can interface with two RS-232 GPS units, or with a combination of one RS-232 GPS unit along with one ARINC 429-capable GPS unit. Connect the MFD ports as appropriate, using Appendix G: *GPS/FMS System Wiring*, on page 96. Follow the set up instructions in Section 5.5.1and Section 5.5.3.

5.5.5 GPS/FMS Communications Check (Messages)

After the MFD has been restarted, any of the following messages may appear in the main viewing screen or in the message bar and Aux or Setup Page.

Table 13: GPS/FMS Communications Messages

Message	Meaning/Action	Action
Nav Source: Is Not Communicating	No RS-232 or ARINC 429 GPS data is being received.	■ Verify GPS is turned On and Valid. ■ Verify correct wiring and COM port setting on GPS and MFD
Nav Source: Data is Not Valid	Data is being received from the external GPS. However, insufficient information is available to determine position.	Aircraft could be in the hanger or the GPS may not have determined its “fix” or location.
Nav Source: Data is Valid	The MFD is receiving valid position data from the GPS/FMS.	—
Nav Source: Data Format Error	Data is being received, however the MFD does not recognize the data as the format selected.	May indicate a baud rate or receiver type error. Verify that the receiver type and baud rate or speed are correct.
Nav Source: No Port selected	The RS232 port setting in the GPS setup dialog is set to NONE.	To correct, choose the port to which the GPS is connected, typically RS232 1.
Nav Source: Reconnecting	This message is displayed when data between the MFD and the GPS is being synchronized.	—

Table 13: GPS/FMS Communications Messages (Continued)

Message	Meaning/Action	Action
Nav Source: Can't Open Port	Another device is configured for the same port.	Check the Setup page for all devices. Typically the GPS/FMS is configured for Port1 (for RS-232) or ARINC1 (for ARINC 429). If a second GPS/FMS is being used it is configured for Port2 or ARINC2.
Heading Data is Not Valid	Heading data is no longer available from the GPS/FMS.	Will only appear if the GPS/FMS is being used as your heading source.
Heading Data is Valid	Heading data has been restored.	—

5.5.6 GPS/FMS Installation-Specific Issues

- **Garmin Installation—**Some Garmin units provide two RS-232 formats for GPS data, “aviation” and “plotting.” “Aviation” format provides a “King” format 9600 baud output at a higher repetition rate and is the preferred RS-232 output. Consult the specific Garmin GPS installation manual for full details.
- **Garmin GNS480 Installations—**Garmin GNS480 units should be wired and configured for RS-232 instead of Arinc 429 since the GNS480 does not output all of the necessary Arinc 429 labels.
- **Northstar Installations—**Many Northstar units have a hidden setup screen to change configuration parameters to make it difficult to change in flight. See the Northstar installation manual for the specific codes to open the setup screen.
- **Trimble 2000A Installations**—This unit has a hidden setup screen documented in the installation manual to change configuration parameters to make it difficult to change in flight. See the Trimble Installation manual for the specific codes to open the setup screen.

Trimble units have been observed to sometimes lose configuration when the aircraft battery is discharged

5.6 Lightning Sensor Setup

The MFD supports the Avidyne TWX670 and L-3 WX-500 Lightning sensors. Table 14 describes the Avidyne TWX670 Configuration Options.

Table 14: TWX670 Configuration Options

Option	Values	Notes
Operating Mode	Weather	Normal operating mode.
	Demo	Used to learn lightning operations.
The options below are available on the "TWX670 Configuration" page.		
Enable Geo Stabilization	Check/Clear	The TWX670 uses data from a connected position source (GPS/FMS).
Enable Heading Stabilization	Check/Clear	The TWX670 uses heading data from a connected heading source (Synchro or any ARINC 429 source).
Enable Audio Output	Check/Clear	Enables audible alerts from the sensor.

There is a button labelled, "TWX670 Config," that goes to another menu with the following options (all check boxes):

- Use Position Source
- Use Heading Source
- Enable Audio Output

The TWX670 will configure these settings automatically, but the check boxes can be used to force particular setups. A red **X** will show next to the check box if the TWX does not agree with the chosen setup.

Table 15 describes the WX-500 configuration options.

Table 15: WX-500 Configuration Options

Option	Values	Notes
Operating Mode	Weather	Normal operating mode.
	Noise Monitor	Supports noise mapping tests.
	Demo	Used to learn lightning operations.
Stab Type	Synchro to WX-500	The WX-500 will use the synchro supplied heading data connected directly to the WX500.
	Stepper to WX-500	The WX-500 will use stepper data from a remote compass system.
	Use Map Heading/Track	The WX-500 will use orientation information supplied by the MFD based on the Map Heading configuration, described in Section 5.11, "Map Heading Source Setup" on page 64.
Enable Lightning Ahead Warning?	Check/Clear	When checked, the MFD issues lightning ahead warning messages.
Antenna on Top?	Check/Clear	Check if the lightning sensor antenna is located on top of the aircraft and must correspond with the WX-500 jumper settings.

5.6.1 Lightning Sensor Setup

➤ To configure the Lightning sensor:

1. From the Maintenance Mode Page, select Lightning Setup. The selection page is displayed:

Figure 10: Selection Page

2. Choose the sensor to be connected to the MFD. The Setup Page is displayed.

For the WX-500 Setup The screen shown in Figure 11 is displayed.

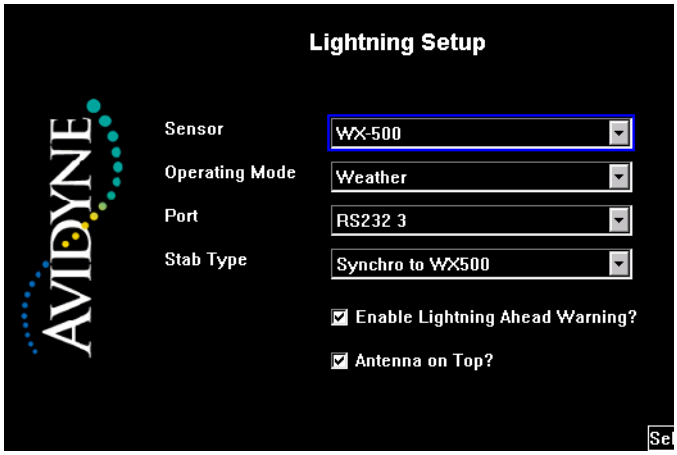


Figure 11: WX-500 Setup Page

For the TWX670 Setup, the screen shown in Figure 12 is displayed.

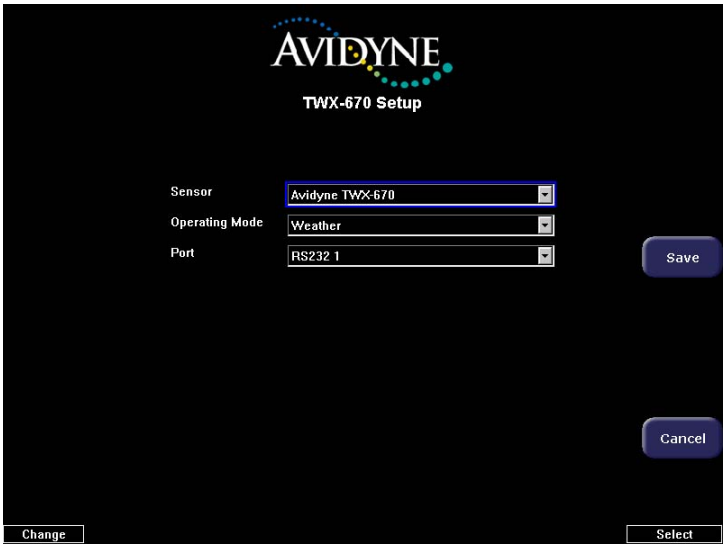


Figure 12: TWX670 Setup Page

3. For WX-500, set the following options:

- Sensor – Select between the lightning sensor and a simulation program (WX-500 only). The normal selection is the sensor name ("Avidyne TWX670" or "WX-500"). The WX-500 simulation setting is used in conjunction with the demo mode on the sensor to simulate operations on the ground.
- Operating Mode – The normal operating mode is weather. Demo is used to simulate lightning operations. For the WX-500, Noise Monitor mode is used during noise mapping tests. See the WX-500 installation manual for testing procedures.
- Port – Set the MFD RS-232 port that is connected to the lightning sensor to match the aircraft wiring.
- **Stab Type—**Select the source of stabilization for use by the WX-500. Stabilization aids in correctly positioning strikes when the aircraft is turning. The choices are:
  - **Synchro to WX500—**a remote compass system that generates and transmits synchro signals received by the WX-500. This heading data can also be used by the MFD to orient the map.
  - **Stepper—**a remote compass system that generates and transmits stepper signals received by the WX-500. This heading data can also be used by the MFD to orient the map. See the Map Heading Setup section.
  - **Use Map Heading/Track—**The WX-500 uses orientation information supplied by the MFD based on the Map Heading configuration, described in Section 5.11, "Map Heading Source Setup" on page 64. The WX-500 receives heading or track data from the MFD via RS232. Heading will be sent from the MFD only if GPS/FMS is the heading source via ARINC 429.

  The best method of stabilization is a heading source (synchro or stepper input to the WX-500 or Map Heading). The next best method is Track. The wiring and WX-500 jumpers must agree with the setup on the MFD.
- **Enable Lightning Ahead Warning?—**Enables display of the Lightning Ahead warning message in the message bar when checked and disables it when not checked.
- **Antenna on Top?—**Indicates that the sensor antenna is mounted on top of your aircraft when checked and that it is mounted on the bottom of your aircraft when not checked.

Note: The antenna position setting and stabilization source must agree with the WX-500 jumper setting and the physical mounting location of the antenna.

4. For the TWX670 the following options are available in the TWX670 Config page:
   - Enable geo stabilization – an external position source (GPS or FMS) connected to the sensor will stabilize the lightning strikes to the aircraft position
   - Enable heading stabilization – an external heading source (e.g., a synchro) connected to the sensor will stabilize the lightning strikes to the aircraft heading.
   - Enable Audio Output – if connected to the aircraft audio panel, the TWX670 will provide audible warnings concerning nearby lightning strikes.

   These options are only available after the Sensor and Port options have been selected and the MFD restarted. Green check marks will appear next to each option if the TWX670 agrees with the configuration. If red X's appear, it may be because another display connected to the sensor is trying to set a different configuration. Consult the TWX670 installation manual for more information.
5. When you are done, press Save. Press Cancel to exit without saving changes.
6. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press Restart System.

In addition to the settings on the Lightning Setup Page, the following buttons may be available:

- **WX-500/TWX670 Diags** – allows access to the lightning sensor diagnostic modes. See your sensor's Installation Manual about how to verify software versions, wiring configurations, antenna environment, and fault logs (not available on all software releases).
- **Self Test (WX-500)** – Runs the WX-500 Self Test and reports Pass or Fail. See the WX-500 Installation Manual for information about testing and the interpretation of the results (not available on all software releases).

5.6.2 Lightning Sensor Checkout

After the MFD has been restarted, any of the following messages may appear in the main viewing screen or the message bar and Setup page.

Table 16: Lightning Sensor Messages

Message	Meaning
Lightning Sensor is Operating Normally	Verifies that strike data to the MFD is valid.
Lightning Sensor in Demo Mode	Demo mode has been selected as the operating mode from the Lightning Setup Page.
Lightning Sensor is in Noise-Monitor Mode	Noise-Monitor mode has been selected as the operating mode from the Lightning Setup Page.
Lightning Sensor in Test Mode	Test mode has been selected as the operating mode from the Lightning Setup Page.
Lightning Sensor ERROR	The Lightning sensor system has reported an error that may mean current data is incomplete or erroneous. The error may clear.
Lightning Sensor has FAILED	The Lightning sensor system has reported an error that may mean current data is incomplete or erroneous. To clear the error, turn off power to the Lightning sensor and turn it on again.

Table 16: Lightning Sensor Messages (Continued)

Message	Meaning
Lightning Sensor is Not Communicating	Communication between the Lightning sensor to the MFD has been lost. ■ Ensure that the wiring between the MFD and the Lightning sensor is correct. ■ Check the port configuration for the Lightning sensor. ■ The Lightning sensor may have an error.
Lightning Ahead	The Lightning Ahead option has been checked on the Lightning Setup page. Displays when a Lightning Ahead condition exists.
Lightning Heading Source Failed	Heading data is no longer available from the WX-500. Strike data may still be valid. Will only appear if the WX-500 is used as the heading source.
Lightning Heading Source OK	Heading data has been restored.
Stuck mic-PLEASE CHECK	Check your COM transmitters for indication of a stuck mike.
Lightning Antenna Location Changed	There may be an inconsistency between the antenna location jumper setting and the software configuration. This message should only appear during installation.
Lightning Position Source Failed **(TWX670 only)**	The position reporting source (GPS or FMS) connected to the TWX670 has encountered a fatal fault.
Lightning Position Source OK **(TWX670 only)**	The position reporting source (GPS or FMS) connected to the TWX670 has returned to normal operation.
Noise Present **(TWX670 only)**	The TWX670 has detected excessive noise in the system. Accuracy and efficiency of the lightning sensor may be negatively affected.
Stuck MK **(TWX670 only)**	Microphone PTT switch is stuck open. Lightning strikes will not be displayed until the problem is fixed.
No Position Data **(TWX670 only)**	The position reporting source (GPS or FMS) connected to the TWX670 is not sending position data.

5.6.3 Lightning Sensor Noise Mode

When operating the Lightning sensor (WX-500 only) in Noise Monitor mode, the Lightning button on the Map page will display “Noise” as the current Lightning state.

➥ Do not press the button in this state, or it may suppress lightning display unnecessarily.

See the operating guide for the Lightning Sensor for more information.

If no lightning strikes are shown at all during noise testing, press the button until it says Display Off, then press once more to return to the proper Noise mode display.

5.7 Traffic Sensor Setup

The EX500/EX600 allows you to acquire traffic information from many different sources. If the aircraft has one of the sensor types shown in Table 17, the MFD will provide traffic alerting, as described in the *EX500/EX600 MFD Pilot Guide*.

The EX500/EX600 only supports the types of traffic sensors shown in Table 17. If you connect a traffic sensor that is not on this list, some data may display, but the traffic sensor control functions and accuracy may be incorrect or inoperable. Display of traffic sensor data is not a guarantee of correct traffic sensor installation and configuration.

5.7.1 Setting up the Traffic Sensor

➤ To set up a Traffic Sensor:

1. From the Maintenance Mode Page, select Traffic Setup. The Traffic Setup Page displays.
2. Set the options for the installed traffic sensor:

Table 17: Traffic System Configuration Options

Sensor	Options	Values			
RS232 Devices	**Port**	RS232 1 to 4			
	Model	■ TAS600 Series ■ TCAD 9900BX ■ TCAD 9900B			
	TCAD Shields (TCAD 9900B only)	**Range**		**Height**	
		Min	**Max**	**Min**	**Max**
	■ Terminal	0.5	1.5	200	1000
	■ Standard	1.0	3.0	500	1500
	■ Enroute	2.0	6.0	1000	2000
TAS	**Port**	ARINC 429 1 to 4			
	TAS Type	■ TAS600 Series ■ TCAD 9900BX ■ SkyWatch ■ Bendix/King			
	External Controller? (Skywatch only)	Checkbox			
TIS-G	**Port**	ARINC 429 1 to 4			
TCAS	**Port**	ARINC 429 1 to 4			
	Maximum Intruders	■ Display All (31) ■ Specified by Sensor ■ Minimum (8)			
	Sensor Range	0 – 128 NM			
	External Mode Control (ABV/BLW/ NRM)	Checkbox			
	External Range Control	Checkbox			

3. The Traffic Setup Page options for the selected sensor displays:

Figure 13: Sample Traffic Setup Pages

4. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
5. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*. If needed, see Table 18, “Traffic Communication Messages,” on page 43.

5.7.2 Traffic Sensor Installation Considerations

- The EX500/EX600 does not provide a mute switch for traffic sensors over an ARINC 429 connection. When installing a traffic sensor using ARINC 429, be sure to install an external mute switch. For more information, see the Avidyne *TAS Installation Manual* or the installation manual for your traffic sensor.
- Before installing any traffic device, see the wiring considerations discussed in Section 4.9.5, “Traffic Sensor Wiring” on page 21.

- If you need to switch between types of installed traffic sensors, first change the traffic sensor type to *None*, press *Save*, and restart the MFD. Then select the new traffic sensor type.
- If you install a TAS600 Series or TCAD 9900BX traffic sensor using an RS-232 port, then the tail number of other aircraft (equipped with Mode S transponders) or squawk codes will display on the Map Page. Squawk codes and tail numbers cannot display if the traffic sensor is installed on an ARINC 429 port.
- If installing the MFD with dual Avidyne display units, such as an EX500/EX600 and a Multi-Hazard Display (MHD), see the *Avidyne TAS600 Series Installation Manual* for wiring procedures and information.

5.7.3 Traffic Sensor Checkout Procedures

RS232 Device Checkout

For the TAS600 Series or TCAD 9900BX, the MFD does not display the TCAD Self Test function. Follow the checkout procedures described in the *Avidyne TAS600 Series Installation Manual*.

TAS (SkyWatch) Checkout

For TAS (SkyWatch), Self Test can only be performed from STANDBY mode and will return to STANDBY mode upon successful completion of the Self Test.

➤ To perform a Self Test:

1. With Traffic in Stand By, rotate the left knob and select the Setup Page.
2. Select Traffic Self Test. The following actions occur:
   - The Map Page displays.
   - The Sensor Status indicates that the sensor is in “Test” and a Traffic test pattern appears on the display.

   If the Self Test fails, an error message is generated and displayed on the MFD screen. See the *SKY497 Installation Manual* for explanations and fault isolation procedures.

➤ To test the Sky497 installation:

1. Use the alternate display procedure described in Appendix E of the *SKY497 Installation Manual*. A terminal device using a RS-232 serial data cable is needed for these setup procedures.
2. See Appendix D in the *SKY497 Installation Manual* for information about configuring the terminal device. Any computer with RS-232 terminal emulation software (e.g., Procomm, HyperTerminal, etc.) may be used as the terminal device.

TAS (Bendix/King) Checkout

➤ To test the TAS (Bendix/King) installation, verify correct communication by monitoring the Message List on the Setup page for the following message: “Traffic Sensor Operating Normally”.

Note: The MFD does not command the KTA870 in Self Test mode. Use the KTA870 control panel if installed. See the *KTA870 Installation Manual* for fault isolation procedures.

TIS-G Checkout

Use a TIS transponder test set to test the combined installation of GTX-330 and the EX500/EX600. If no test set is available, conduct operations in an area that supports TIS data and verify that data is received and traffic is displayed.

5.7.4 Traffic Communications Check (Messages)

After restarting the MFD, any of the following messages may appear in the main viewing screen or the message bar and Setup page.

Table 18: Traffic Communication Messages

Message	Meaning
Traffic Sensor is Not Communicating	Traffic data is not being received.
Traffic Sensor is in Stand-By (TAS/TIS)	The traffic sensor has been placed in Standby mode.
Traffic Sensor is in Self-Test (TAS)	The traffic sensor has been placed in Self-Test mode.
Traffic Sensor is Operating Normally	Verification that Traffic data is valid.
TCAD Altitude Unavailable (TCAD)	Occurs when altitude data has been lost from the TCAD sensor.
Traffic Sensor has Failed	The traffic sensor has reported an internal fault, or the RS-232 ports are not configured correctly (TCAD).

Note: After completing all configuration procedures, confirm that the EX500/EX600 is configured for the correct Traffic sensor.

5.8 TAWS Setup (Optional)

The EX500/EX600 can interface to Honeywell EGPWS systems with Phase 2 or later software.

5.8.1 TAWS Setup

➤ To configure the TAWS interface:

1. From the Maintenance Mode Page, select TAWS Setup. The TAWS Setup Page displays:

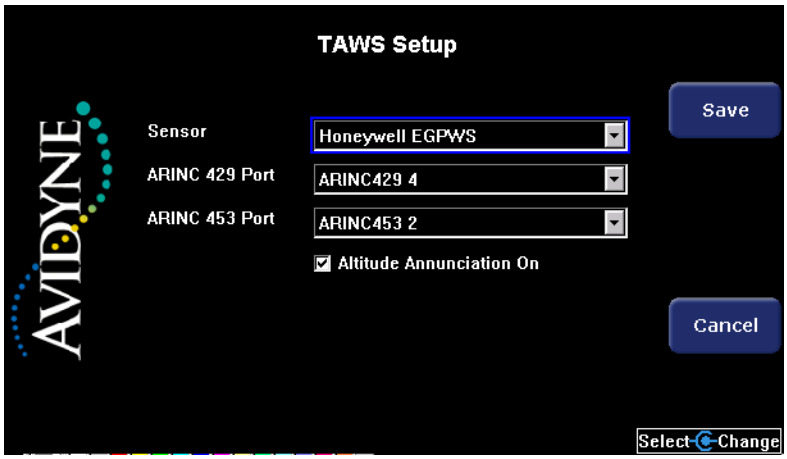


Figure 14: TAWS Setup Page

2. Set the following options:
   - **Sensor—**Honeywell EGPWS
   - **ARINC 429 Port—**ARINC 429 4 – TAWS Default
   - **ARINC 453 Port—**ARINC 453 2 – TAWS Default
   - **Altitude Annunciation On—**Select this feature to permit a visual annunciation of GPS altitude on the TAWS display. If selected, a checkmark displays.
3. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
4. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

TAWS Checkout

➤ To test the TAWS installation:

1. From the Maintenance Mode Page, select TAWS Setup.
2. Perform a functional test of the EGPWS system in accordance with manufacturer's instructions. See the *EX500/EX600 Multi-Function Display Pilot's Guide* for display operation.
3. If the Self Test fails, an error message is generated and displayed on the MFD display. See the *EGPWS System Installation Manua*l for explanations and fault isolation procedures.

5.8.2 TAWS Communications Check (Messages)

If there is a communication or data error between the TAWS sensor and the MFD, one of the following messages will display on the bottom of the screen.

Table 19: TAWS Error Messages

Message	Meaning/Action
TAWS Failed	The system configuration is incorrect or one of the system components has failed. ■ Verify that the sensor is turned on and valid. ■ Verify system wiring.
TAWS Initializing	If message does not clear within 60 seconds, communication between the MFD and the Terrain sensor has not been established. ■ Verify that the sensor is turned on and valid. ■ Verify system wiring. ■ See terrain sensor Installation and User's Manual for troubleshooting guidance.
TAWS Not Communicating	Indicates that the MFD is not receiving data from the Terrain sensor. ■ Verify that the sensor is turned on and valid. ■ Verify system wiring. ■ See TAWS sensor Installation and User's Manual for troubleshooting guidance.
TAWS Display Unavailable	The TAWS Sensor has declared itself inoperative. ■ Verify system wiring. ■ Verify that the sensor inputs to the TAWS are turned on and valid. ■ See TAWS sensor Installation and User's Manual for troubleshooting guidance.
TAWS Sensor Self-Test	The TAWS Sensor is performing a Self-Test. The message will remain until the self-test is finished. ■ Verify that the "Self-Test" mode has been not been selected at the separate TAWS control panel. ■ Verify system wiring. ■ See TAWS sensor Installation and User's Manual for troubleshooting guidance.
TAWS Inhibited	The TAWS sensor is in the "Inhibited" mode. ■ Verify that the "Inhibit" mode has been not been selected at the separate TAWS control panel. ■ See TAWS sensor Installation and User's Manual for troubleshooting guidance.

Note: If the EGPWS interface is operating properly, there will be no system status messages.

5.9 Radar Sensor Setup

The EX500/EX600 supports a number of different radar types, briefly described in Table 7, “EX500 Part Numbers,” on page 11 or Table 8, “EX600 Part Numbers,” on page 11. The available configuration options, described in Table 21, “Radar Options,” on page 48 are radar specific.

This section contains the following information:

- *Supported Radar Features*, page 46
- *Setting up Radar Support*, page 48
- *Radar Configuration Options*, page 48
- *Adjusting the Roll Trim*, page 49
- *Calibrating the Radar System*, page 49
- *Radar Checkout*, page 57
- *Radar Communications Troubleshooting*, page 58

5.9.1 Supported Radar Features

Table 20 describes the features available in each type of supported radar.

Table 20: Radar Feature Matrix

Radar Type	Range Values	Scan Arcs supported	# of colors	Multiple Ind	Stabilization	Stab on-off ctrl	Auto-Tilt	VP	Roll Trim adj	ARL/PAC	Target Alert	Azim Lines other than 0x
Bendix/King												
RT-131A (RDR-130/RDR-150) with: ■ AT-133A/AT-133A INV ■ DA-144A/A-144A INV	5, 10, 20, 40, 80, 160	90°	3				*					
RT-131A (RDR-1100) with DA-1203A antenna	10, 20, 40, 80, 160, 240	60°, 120°	3		•		*		•			
ART-161A (RDR-160)	5, 10, 20, 40, 80, 160	90°	3				*					
RS-811A (RDS-81)	10, 20, 40, 80, 160, 240	90°	4	•	•	•	*		•			
RS-181A (RDS-82)	10, 20, 40, 80, 160, 240	90°	4	•	•	•	*		•			
RS-181A-VP (RDS-82VP)	10, 20, 40, 80, 160, 240	90°	4	•	•	•	*	•	•			
RS-841A (RDS-84)	5, 10, 20, 40, 80, 160, 240, 320	120°	4	•	•		*		•			
RS-841A-VP (RDS-84VP)	5, 10, 20, 40, 80, 160, 240, 320	120°	4	•	•		*	•	•			
RS-861A (RDS-86)	5, 10, 20, 40, 80, 160, 240, 320	120°	5	•	•		•		•	•		
RS-861A-VP (RDS-86VP)	5, 10, 20, 40, 80, 160, 240, 320	120°	5	•	•		•	•	•	•		

Table 20: Radar Feature Matrix (Continued)

Radar Type	Range Values	Scan Arcs supported	# of colors	Multiple Ind	Stabilization	Stab on-off ctrl	Auto-Tilt	VP	Roll Trim adj	ARL/PAC	Target Alert	Azim Lines other than 0x
ART-2000 (RDR-2000)	10, 20, 40, 80, 160, 240	90°, 100°	4	•	•	•		•	•		•	
ART-2100 (RDR-2100)	5, 10, 20, 40, 80, 160, 240, 320	60°, 90°, 100°, 120°	5	†	†	†	†	†	†	†	†	
RT-131A (RDR-1100)	10, 20, 40, 80, 160, 240	60°, 120°	3		•	•	*		•			
RT-1201A (RDR-1200)	10, 20, 40, 80, 160, 240	60°, 120°	3		•	•	*		•			
RT-1201A (RDR-1200) with DA-1203A antenna	10, 20, 40, 80, 160, 240	60°, 120°	3		•	•	*		•			
RT-1301A/B (RDR-1300) with DA-1203A antenna	10, 20, 40, 80, 160, 240	60°, 120°	3		•	•	*		•			±15°, ±30°
Collins												
WXT-250A (WXR-270)	10, 25, 50, 100, 250	120°	3		•	•	*				•	±30°
WXT-250B (WXR-270A) [200MI]	10, 25, 50, 100, 200	120°	4		•	•	*			•	•	±30°
WXT-250B (WXR-270) [250MI]	10, 25, 50, 100, 250	120°	4		•	•	*			•	•	±30°

**. Support provided by Avidyne software*

†. Support native to R/T

Features provided by software available for all sensors:

- Beam Altitude and Beam Width display
- Bearing Line
- Tilt Settings ±15°
- Startup/Standby Tilt Parking

5.9.2 Setting up Radar Support

➤ To set up radar support:

1. From the Maintenance Mode Page, select *Radar Setup*. The Radar Setup Page displays:

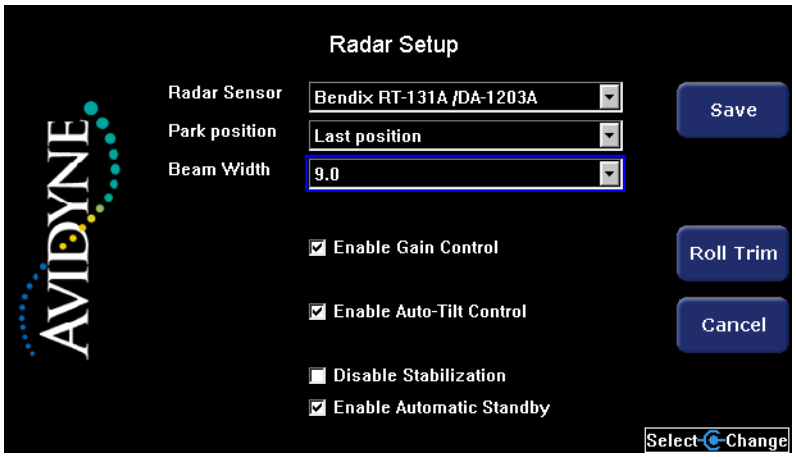


Figure 15: Radar Setup Page

2. From the Radar Setup Page, select the radar sensor installed on this aircraft.
3. Press *Save* to save the radar selection, and then press *Restart System.*
4. Enter Maintenance Mode again and reselect *Radar Setup*.
5. The Radar Setup page will now display the options for the installed radar system.
6. See Table 21 and Table 22 for information about the options that may display.
7. If the Roll Trim button displays, adjust the roll trim as described in Section 5.9.4, “Adjusting the Roll Trim” on page 49
8. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
9. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.9.3 Radar Configuration Options

Table 21 describes the configuration options with many radar systems. For more information, see the installation and operations manuals for your radar system.

Table 21: Radar Options

Option	Value	Notes
Park Position	Last position	Set the park/startup position for the radar antenna tilt angle.
	Full up	
	Centered	
	Full down	
Beam Width	0.0^{O} – 19.5^{O}	Defines the Width and Height of the radar sweep graphical depiction on the EX500 radar display. Typical beam widths are shown in Table 22.
Beam Height	0.0^{O} – 19.5^{O}	
Enable Gain Control	Checkbox	Enables R/T variable gain control to be commanded from the EX500/EX600.
Enable VP	Checkbox	When checked, enables Radar Vertical Profile mode.

Table 21: Radar Options (Continued)

Option	Value	Notes
Enable Auto-Tilt Control	Checkbox	When checked, enables Radar auto-tilt mode.
Primary Indicator (1)	Checkbox	When checked, enables EX500/EX600 control of radar functions.
Disable Stabilization	Checkbox	Disables EX500/EX600 display of the “Stab Off” annunciation
Enable Automatic Standby	Checkbox	When checked, enables the EX500/EX600 to auto-command the radar to standby when ground is sensed to be below 20 kts.
ARINC 429 Port	—	Digital Radar Only
ARINC 453 Port	—	Digital Radar Only

Table 22 describes the beam width selections. For more information see the installation and operations manuals for your radar system.

Table 22: Radar Beam Widths

Antenna Width	Generic Beam Width	Bendix/King Radars	Collins Radar
10”	10°	10°	9.5°
12”	8°	8°	8°
18”	5°	5.6°	6°

5.9.4 Adjusting the Roll Trim

➤ To adjust the Roll Trim Adjustment:

1. From the Maintenance Mode Page, select *Setup Radar*.
2. From the Radar Setup page, select *Roll Trim.*
3. The Roll Trim value appears on the Radar screen and can be modified by the Roll Trim control knob.
4. When you are done, press *Back* to save the new Roll Trim setting and return to the Radar Setup Page.
5. Press *Save* from the Radar Setup Page. Press *Cancel* to exit without saving changes.
6. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.9.5 Calibrating the Radar System

Some radar systems require calibration after installation. When you restart the Radar Setup page, an R/T Calibration button displays if required.

➥ Perform radar R/T calibration according to the procedures and specifications for the specific unit installed in the aircraft.

You can calibrate the radar after it has been installed, setup and checked out per the radar manufacturer’s instructions.

Calibrating the Bendix/King RS-181A and RS-8xx Series Radar Sensors

➤ To calibrate the system:

1. From the Maintenance Mode Page, select *Setup Radar*.
2. From the Radar Setup page, select R/T Calibration.
3. Calibrate the radar following the specifications in the R/T unit's Installation Manual.

4. Press *Enter* to accept the new values.
5. When you are done, press *Save* from the Radar Setup Page. Press *Cancel* to exit without saving changes.
6. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

Calibrating the AlliedSignal (Bendix/King) 2000/2100 Radar Sensor

This section describes Post-Installation System Configuration and Calibration of the Bendix/King ART-2000/2100 Radar System using the EX500/EX600 and replaces specific sections of the Bendix/King *Installation Manual* that describe configuration and calibration using the Bendix/King IN-182A Indicator.

➤ To configure and calibrate the system, follow the original Bendix/King Installation Manual substituting the following two sections with the instructions provided herein:

- 2.4.1 CONFIGURATION PROCEDURE USING RADAR INDICATOR
- 2.4.4.1 Stabilization Calibration with Radar Indicator

Note: If the EX500/EX600 is replacing the indicator of a currently installed and previously calibrated ART-2000/2100 Series Radar, this procedure may not be necessary. The calibration values are contained in the configuration module of the R/T and should remain valid. Avidyne recommends that you check the calibration values after the Avidyne unit has been installed to ensure that nothing has changed.

Bendix/King Installation Manual Replacement Section 1

2.4.1 CONFIGURATION PROCEDURE USING RADAR INDICATOR

The R/T Configuration Module must be configured using the Allied Signal KPA 900 Configuration Module Programmer Kit (Part Number 050-03311-0000) in conjunction with a personal computer. See the configuration module user data for detailed setup instructions. Follow the instructions for the programmer.

2.4.1.1 Antenna Clearance Check

Complete the Antenna Clearance Check by performing the following steps:

A. From the Aux Page, enter Maintenance Mode, as described in Section 5.4, “Using the Maintenance Mode Page” on page 27).

B. Set the radar park position to Full Up.

C. Restart the MFD.

D. From the Radar Setup Page, set the radar Function to SBY.

E. Set the radar Mode to GND.

F. Reduce the gain until the gain indicator shows the minimum setting.

G. Set the Antenna Tilt to full UP (U 15.0).

H. Set Range to 240 NM.

I. From the Aux Page, enter Maintenance Mode, as described in Section 5.4, “Using the Maintenance Mode Page” on page 27).

J. Press *Radar Setup*.

K. Press *Calibration* to display the RT CALIBRATION DATA page. Upon display of the RT CALIBRATION DATA page with the system in calibration mode, all fault fields will flash briefly. This verifies that the system is in calibration mode.

L. Starting at -30, slowly adjust the gain downward until the antenna clearance scan begins. This should take place at a gain value no lower than -26. The antenna will move to each of the extreme positions to determine that there is no interference with antenna movement and all scan motors are working properly.

Bendix/King Installation Manual Replacement Section 2

2.4.4.1 Stabilization Calibration with Radar Indicator

To calibrate the radar pitch and roll:

A. From the Aux Page, enter Maintenance Mode, as described in Section 5.4, “Using the Maintenance Mode Page” on page 27. Select *Radar Setup* to display the Radar Setup Page:

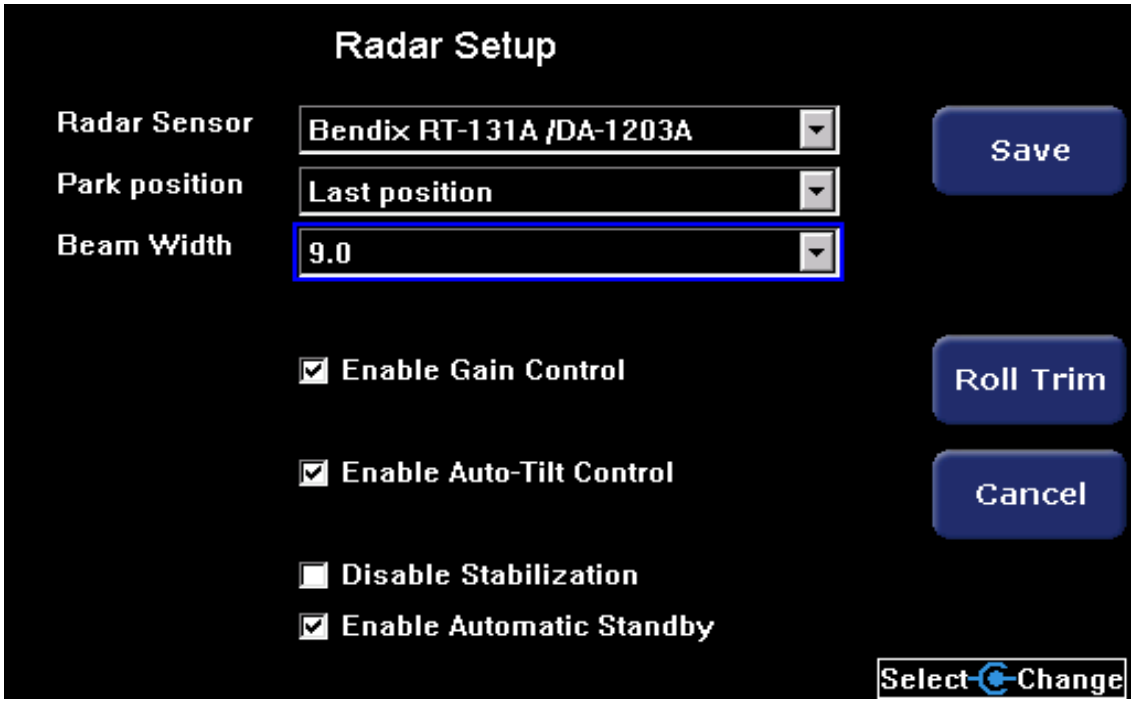


Figure 16: Radar Setup Page

Note: Once the ART-2000/2100 has been installed, the Radar Setup Page will be similar to the Page shown here.

B. Set Park position to Full up.

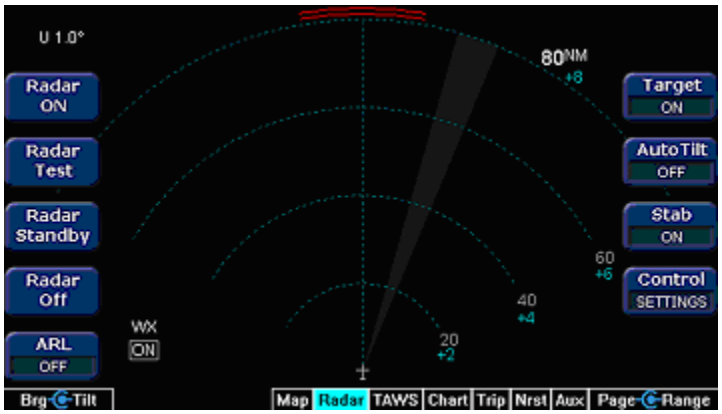
C. Ensure that Enable Automatic Standby is selected.

D. Restart the MFD, and open the Radar Page.

E. From the Radar Page:

- Press *Radar Standby* until the GND setting reads STBY.
- Set *Mode* to GND. The *Knob* button will display in the lower left corner.
- Set *Knob* to Gain.
- Use the *Gain* knob (outer left) to reduce the gain until the Gain indicator in the upper right shows the minimum setting. Note that you need to turn the Gain knob *clockwise* to reduce the gain (and counter-clockwise to increase it).
- Use the Tilt knob (inner left) to set the Antenna Tilt to full UP (U 15.0^{o}).
- Use the Range knob (inner right) to set the range to 240 NM.

When the Radar Page is ready, it will look similar to the following:



Note: Failure to set any of the settings described in step E will prevent you from entering calibration mode. If more than one radar indicator is installed in the system, all but one indicator must be in the OFF or STBY position in order for the system to enter the calibration mode.

F. Open the Aux Page and enter Maintenance Mode.

G. Press *Radar Setup* to display the Radar Setup Page.

H. From the Radar Setup Page, press *Calibration* to display the Calibration Page (see the Bendix/ King Installation Manual). When the system opens in calibration mode, all Fault fields will flash briefly.

If the Fault fields do not flash, the Calibration Page is only open in display mode and you cannot make changes. Make sure that you carefully followed the instructions in step E and try to enter calibration mode again.

I. Once you are in calibration mode, use the left outer knob to set ROLL TRIM to 0^{o}.

J. If desired, copy all displayed values to a notepad in case you need to recall a value that is accidentally changed.

Note: For information about how to adjust the radar settings, see the Bendix-King *Installation Manual*.

➥ If using an ARINC 429 gyro, proceed to step Q.

K. Calibrate 400 Hz REF GAIN

1. Set the tilt table to 0^{o} pitch and roll.
2. Use the GAIN control to set the GAIN POT /2 setting between 28- and 30-.
3. Set the 400 Hz REF field to 0.0 $\pm 1.0^{o}$. To adjust the value:
   - To increment the value of 400 Hz REF, use the right inner knob to change the TILT SETTING to between 5 and 10 UP. When the TILT SETTING is set to between 5 and 10 UP, the value of he 400HzZ REF field will slowly increase.
   - To decrement the value of 400 Hz REF, use the right inner knob to change the TILT SETTING to between 5 and 10 DOWN. When the TILT SETTING is set to between 5 and 10 DOWN, the value of the 400HZzREF field will slowly decrease.

- When you reach the desired setting, quickly adjust the TILT SETTING to above 10 UP to lock in the setting.

4. Proceed to step L.

Note: If the 400 Hz REF field is zero (0), and does not change when the TILT knob is adjusted, check that the correct gyro has been selected when programming the Configuration Module.

L. Calibrate PITCH GAIN

1. Set the tilt table for 10^{o} pitch up.
2. Use the GAIN control to set the GAIN POT /2 setting to 25- or 26-.
3. Set the PITCH ANGLE field to 10.0 ±1.0^{o}.
   - To increment the value of the PITCH ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 UP. When the TILT SETTING is set to between 5 and 10 UP, the value of the PITCH ANGLE field will slowly increase.
   - To decrement the value of PITCH ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 DOWN. When the TILT SETTING is set to between 5 and 10 DOWN, the value of the PITCH ANGLE field will slowly decrease.
   - When you reach the desired setting, quickly adjust the TILT SETTING to above 10 UP to lock in the setting.
4. Set for 10^{o} PITCH DOWN. Repeat steps 2 and 3.
5. Set the tilt table to 0^{o} pitch and roll.
6. Proceed to step M.

M. Calibrate PITCH OFFSET

1. Use the GAIN controls to set the GAIN POT /2 setting to 18- or 19-.
2. Check that the tilt table is set for 0^{o} pitch.
3. Set the PITCH ANGLE field to 0.0 ±1.0^{o}.
   - To increment the value of the PITCH ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 UP. When the TILT SETTING is set to between 5 and 10 UP, the value of the PITCH ANGLE field will slowly increase.
   - To decrement the value of PITCH ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 DOWN. When the TILT SETTING is set to between 5 and 10 DOWN, the value of the PITCH ANGLE field will slowly decrease.
   - When you reach the desired setting, quickly adjust the TILT SETTING to above 10 UP to lock in the setting.
4. Set the tilt table to 10^{o} pitch up. The value should be 10.0U ±1.0^{o}. If the value is out of range, repeat step L.
5. Set the tilt table to 10^{o} pitch down. The value should be 10.0D ±1.0^{o}. If the value is out of range, repeat step L.
6. Set the tilt table to 0^{o} pitch. The value should be 0.0 ±1.0^{o}. If the value is out of range, repeat this step (step M.).

7. Proceed to step N.

N. Calibrate ROLL GAIN

1. Set the tilt table for 10^{o} roll right.
2. Use the GAIN controls to set the GAIN POT /2 setting between 21- and 23-.
3. Set the ROLL ANGLE field to 0.0 $\pm 1.0^{o}$.
   - To increment the value of the ROLL ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 UP. When the TILT SETTING is set to between 5 and 10 UP, the value of the ROLL ANGLE field will slowly increase.
   - To decrement the value of ROLL ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 DOWN. When the TILT SETTING is set to between 5 and 10 DOWN, the value of the ROLL ANGLE field will slowly decrease.
   - When you reach the desired setting, quickly adjust the TILT SETTING to above 10 UP to lock in the setting.
4. Set the tilt table for 10^{o}roll left. Repeat Steps 2 and 3 of this section.
5. Set the tilt table for 0^{o} pitch and roll.
6. Proceed to step O.

O. Calibrate ROLL OFFSET

1. Use the GAIN control to set the GAIN POT /2 setting between 14- and 16-.
2. Check that the tilt table is set for 0^{o} roll.
3. Set the ROLL ANGLE field to 0.0 $\pm 1.0^{o}$.
   - To increment the value of the ROLL ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 UP. When the TILT SETTING is set to between 5 and 10 UP, the value of the ROLL ANGLE field will slowly increase.
   - To decrement the value of ROLL ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 DOWN. When the TILT SETTING is set to between 5 and 10 DOWN, the value of the ROLL ANGLE field will slowly decrease.
   - When you reach the desired setting, quickly adjust the TILT SETTING to above 10 UP to lock in the setting.
4. Set the tilt table to 10^{o} roll right. The value should be 10.0R $\pm 1.0^{o}$. If the value is out of range, repeat step N.
5. Set the tilt table to 10^{o} roll left. The value should be 10.0L $\pm 1.0^{o}$. If the value is out of range, repeat step N.
6. Set the tilt table to 0^{o} roll. The value should be 0.0 $\pm 1.0^{o}$. If the value is out of range, repeat this step (step O.).
7. Proceed to step P.

P. Save Configuration

1. Adjust the GAIN controls for a GAIN POT /2 setting to 4- or 5-.
2. The FAULTS field will display GYRO.

3. Set the TILT SETTING to 15.0D. The fault fields will flash indicating that your settings are being saved. If the save procedure is successful, the GYRO fault will disappear and the azimuth count will cycle through its entire number range.

Note: For an example, see step S.

4. If the GYRO fault remains, set TILT to 0 and repeat step 3.
5. After saving the configuration, this section is complete.

For radar with an ARINC 429 gyro, start here after completing step L.

Q. Calibrate AHRS ARINC 429 PITCH OFFSET

1. Adjust the GAIN buttons for a GAIN POT /2 setting to 11- or 12-.
2. Check that the tilt table is set for 0^{o} pitch.
3. Set the PITCH ANGLE field to 0.0 $\pm 1.0^{o}$.
   - To increment the value of the PITCH ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 UP. When the TILT SETTING is set to between 5 and 10 UP, the value of the PITCH ANGLE field will slowly increase.
   - To decrement the value of PITCH ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 DOWN. When the TILT SETTING is set to between 5 and 10 DOWN, the value of the PITCH ANGLE field will slowly decrease.
   - When you reach the desired setting, quickly adjust the TILT SETTING to above 10 UP to lock in the setting.
4. Set the tilt table to 10^{o} pitch up. The value should be 10.0U $\pm 1.0^{o}$. If the value is out of range, repeat Steps 1, 2 and 3 of this section.
5. Set the tilt table to 10^{o} pitch down. The value should be 10.0D $\pm 1.0^{o}$. If the value is out of range, repeat Steps 1, 2, 3 and 4 of this section.
6. Set the tilt table to 0^{o} pitch. The value should be 0.0 $\pm 1.0^{o}$.
7. Proceed to step R.

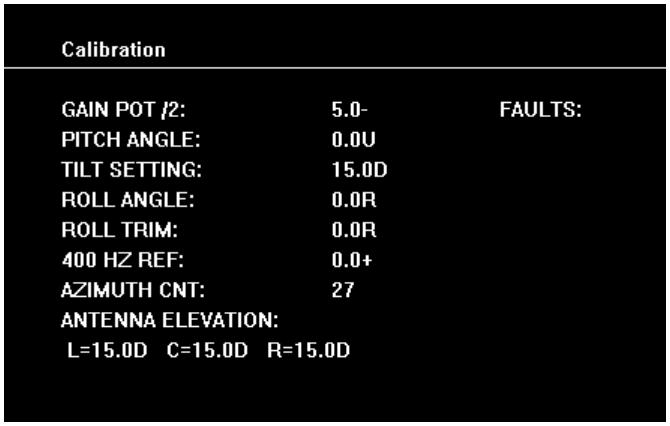
R. Calibrate AHRS ARINC 429 ROLL OFFSET

1. Adjust the GAIN controls for a GAIN POT setting to between 7- and 9-.
2. Check that the tilt table is set for 0^{o} roll.
3. Set the ROLL ANGLE field to 0.0 $\pm 1.0^{o}$.
   - To increment the value of the ROLL ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 UP. When the TILT SETTING is set to between 5 and 10 UP, the value of the PITCH ANGLE field will slowly increase.
   - To decrement the value of ROLL ANGLE, use the right inner knob to change the TILT SETTING to between 5 and 10 DOWN. When the TILT SETTING is set to between 5 and 10 DOWN, the value of the ROLL ANGLE field will slowly decrease.
   - When you reach the desired setting, quickly adjust the TILT SETTING to above 10 UP to lock in the setting.

4. Set the tilt table to 10^{o} roll right. The value should be 10.0R ±1.0^{o}. If the value is out of range, repeat step R.
5. Set the tilt table to 10^{o} roll left. The value should be 10.0L ±1.0^{o}. If the value is out of range, repeat step R.
6. Set the tilt table to 0^{o} roll. The value should be 0.0 ±1.0^{o}.
7. Proceed to step S.

S. Save Configuration

1. Adjust the GAIN controls for a GAIN POT /2 setting to 4- or 5-.
2. The FAULTS field will display GYRO.
3. Set the TILT SETTING to 15.0D. The fault fields will flash indicating that your settings are being saved. If the save procedure is successful, the GYRO fault will disappear and the azimuth count will cycle through its entire number range.



4. If the GYRO fault remains, set TILT to 0 and repeat step 3.
5. After saving the configuration, this section is complete.

Bendix/King Replacement Sections END

5.9.6 Radar Checkout

Perform a functional test of the RADAR system in accordance with manufacturers instructions. See the Avidyne *EX500/EX600 MFD Pilot Guide* for display operation.

5.9.7 Radar Communications Troubleshooting

If there is a communication or data error between the RADAR sensor and the MFD, one of the following messages will display on the bottom of the screen.

Table 23: Radar Sensor Error Messages

Message	Meaning/Action
Radar Sensor Data Is Invalid	Data received from the RADAR sensor system can not be used by the EX500/EX600. ■ Cycle power on the EX500/EX600. ■ See the Installation and User's Manual for your radar system for troubleshooting guidance.
Radar Sensor Has Failed	The RADAR sensor system has reported an error. ■ Check R/T configuration module error log. ■ See the RADAR Sensor Installation and User's Manual for troubleshooting guidance.
Radar Sensor Is Not Communicating	Communication of return data from the RADAR sensor to the MFD has been lost. ■ Verify that the RADAR sensor is turned on and valid. ■ Verify that the EX500/EX600 is properly seat in its tray. ■ Verify system wiring.
Invalid GPS Data and Radar is ON	The RADAR is ON and the EX500/EX600 has no ground speed data available from the GPS/FMS. ■ Verify the GPS/FMS is ON and valid. ■ Verify system wiring. ■ See the Installation and User's Manual for your radar system for troubleshooting guidance.
Radar Automatic Standby Disabled	The RADAR is ON, the EX500/EX600 RADAR automatic standby mode is disabled, and the EX500/EX600 has no ground speed data available from the GPS/FMS. ■ Verify the GPS/FMS is ON and valid. ■ Verify system wiring. ■ See the Installation and User's Manual for your radar system for troubleshooting guidance.

5.10 Aircraft Setup

The options on the Aircraft Setup Page depend on the aircraft model and selected options for that aircraft. These options may include:

- Auxiliary Data
- Two-Way Datalink
- Broadcast Datalink
- Dimming Bus

Note: The available options are dependent on the aircraft model and additional purchased features. Your aircraft may not have all options available.

➤ To configure the Aircraft Setup Page:

1. From Maintenance Mode, select Aircraft Setup. The Aircraft Setup Page displays:

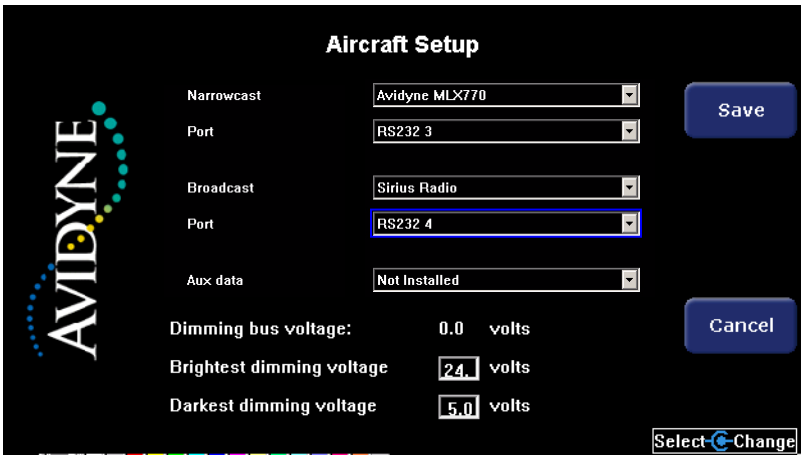


Figure 17: Aircraft Setup Page with Datalink

2. Set the options that appear on the Aircraft Setup Page. These options will vary depending on the aircraft model and optional features selected.

   Aircraft Setup options are described in the following sections:

   - Section 6.6, “ORBCOMM Satellite Reception (EX500 Only)” on page 72
   - Section 5.10.2, “Broadcast Datalink Setup” on page 61
   - Section 5.10.3, “Dimming Bus Setup” on page 63

3. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
4. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.10.1 Two-Way Datalink Setup

If Narrowcast (2-Way) Datalink is installed in this aircraft, the Narrowcast pull-down will be available.

Select (enable) the appropriate Narrowcast transceiver as follows:

- **Narrowcast—**Select the appropriate transceiver:
  - **Avidyne MLX770**—Enables a connected MLX770 Iridium transceiver.
  - **Quake SC**—Enables an internal ORBCOMM Datalink transceiver (EX500 Only).
  - **Not Installed**—Select if no MLX770 or internal ORBCOMM Datalink transceiver is installed.

Note: If a 2-Way Datalink transceiver is not installed and you do not select *Not Installed*, the pilot will receive a steady stream of Narrowcast error messages as the EX500 attempts to establish a 2-Way Datalink connection.

- **Port—**RS232 port 6 (ORBCOMM), or as wired (MLX770).

Note: Two-Way Datalink messages display as Narrowcast.

Note: Do not select RS232 ports 5 or 6 for MLX770.

MLX770 Iridium Datalink Checkout

➤ To check the MLX770 Iridium Datalink installation:

1. On the Maintenance Mode page, select System Info. The System Info page opens:

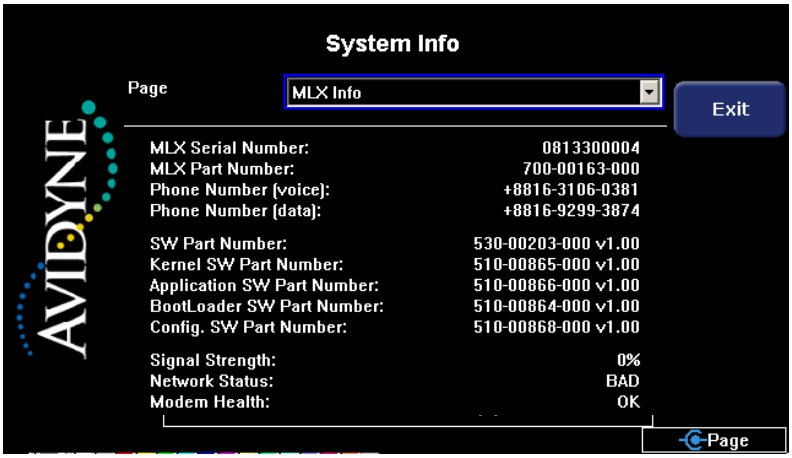


Figure 18: System Info—MLX Info Page for Iridium

2. In the Page dropdown, select MLX Info.
3. On the MLX Info page, verify the MLX Serial Number and software versions.

   If MLX770 transceiver is enabled and the port is selected on the Aircraft Setup Page, the EX500/EX600 is configured for Iridium Datalink operation.

➥ To finish the checkout process, see the *MLX770 Installation Manual*.

ORBCOMM Datalink Checkout (EX500 Only)

➤ To check the ORBCOMM Datalink installation:

1. From the Maintenance Mode page, select System Info. The System Info page displays:

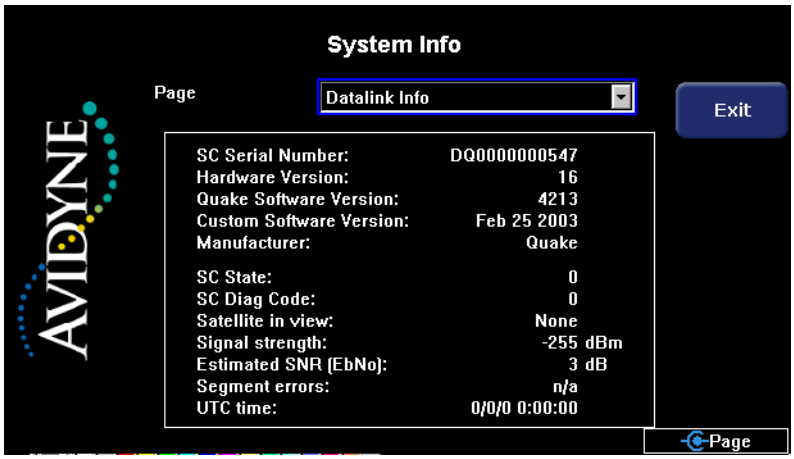


Figure 19: System Info—Datalink Info Page for ORBCOMM

2. In the Page dropdown, select Datalink Info.
3. On the **Datalink Info** page, verify the SC Serial Number and software versions.

   If ORBCOMM is enabled and the port is selected on the Aircraft Setup page, the EX500 is configured for ORBCOMM operation.

➥ To finish the checkout process, see Section 6.6, “ORBCOMM Satellite Reception (EX500 Only)” on page 72.

Note: ORBCOMM-network Narrowcast support is expected to cease in 2010. Contact Avidyne for more details.

5.10.2 Broadcast Datalink Setup

The EX500/EX600 supports the Heads Up XMD076 XM data receiver or Avidyne MLB700.

Configure Broadcast as follows:

- **Broadcast**—XM WX Satellite Weather, MLB 700 Sirius Radio, or None. This enables the Datalink functionality and communication with the satellite data receiver.
- **Port—**Select the RS-232 port wired to the Broadcast Datalink receiver.

Broadcast Datalink Checkout

➤ To check the Broadcast Datalink Installation:

1. Power up the MFD and Broadcast Datalink Receiver and select the Trip Page.
2. From the Trip Page, press *Display* to view Broadcast Status (down pointing arrow). If the MFD reports a Receiver ID or Serial Number, the receiver is communicating with the MFD and the RS-232 wiring is correct.
3. Position the aircraft in an area open to the sky.

4. Check the Signal Quality, as displayed on the lower half of the Trip Page.
   - **Good**—Confirms the receiver is detecting the satellite signals.
   - **Marginal** or **Weak**—May require repositioning the aircraft to better location.
   - **None**—Indicates a bad antenna, cable, connection or receiver.

➤ To test the installation of the MLB700 Broadcast Datalink Receiver:

1. Move the aircraft outdoors to a location with an unobstructed view of the sky and power-up the avionics.
2. Log into www.MyAvidyne.com using your dealer credentials.
3. Click on "MLB700" at the top of the page and provide the ESN1 from the affixed label or packing slip. Click "Send Test Signal."
4. After 10 minutes the MLB700 will have received the information it requires. Power-down the avionics. Wait 30 seconds and re-apply the power.
5. Turn the EX500/EX600 to the Trip Page. Press the "DISPLAY" button until it indicates "STATUS." Once the MLB700 completes the 3 minute 15 second initialization and self test sequence, it will begin to gather and display limited weather data. If any of the weather products update, the installation of the weather side of the receiver is correct.

   The SIRIUS® Satellite Radio receiver (Audio receiver) that is integrated into the MLB700 will initially tune to the preview channel, 184, and begin to provide audio entertainment to the audio panel once the 3 minute 15 second initialization and self test sequence has completed.
6. Listen for audio from SIRIUS channel 184 via the aircraft's audio system. If you can hear any audio, this indicates the installation of the audio side of the receiver is correct.

Note: **Note to Dealer**: To activate the MLB700, your customer will need the 10-digit hardware serial number and the 12-digit electronic serial numbers associated with the Datalink and Audio receivers. These number are integrated into the MLB700 unit. Record the required numbers below and give this manual to the aircraft owner when the aircraft is returned to service. The serial numbers are found on the exterior of the MLB700 case, on the original packaging, and on the packing slip.

Hardware Serial Number (Unit S/N):_____

Datalink Receiver Serial Number (ESN1):_____

Audio Receiver Serial Number* (ESN2):_____

*All MLB700 Broadcast Datalink Receivers have a SIRIUS Satellite Radio serial number, although not all hardware is enabled for SIRIUS Satellite Radio. If your device is enabled to receive SIRIUS® Satellite Radio entertainment, you will also have been provided with a RC70 remote control.

For more information, see the *XMD076 XM Receiver Installation Manual and Activation Instructions* from Heads Up Technologies or contact Heads Up Technologies at service@heads-up.com or (972) 407-1131.

Note: If Broadcast Datalink does not connect because the XM trial period has expired, call Heads Up Technologies at (972) 407-1131 to activate the account for testing. For information about customer activation, see the *EX500/EX600 Multi-Function Display Pilot's Guide*.

After restarting the MFD, either of the following messages may appear in the message bar on any page and in the message list on the Aux or Setup Page.

Table 24: Broadcast Datalink Messages

Message	Meaning
Broadcast is Operating Normally	Verifies that the MFD is communicating with the Broadcast Datalink Receiver
Broadcast is Not Communicating. (After 5 minutes of no communication).	The MFD is not communicating with the Broadcast Datalink Receiver. Check power and signal wiring.

➥ Make a note of the Receiver ID for the aircraft owner, who will need it to begin Broadcast Datalink service.

➥ To finish the checkout process, see Section 6.7, “Broadcast Datalink Satellite Reception” on page 73.

5.10.3 Dimming Bus Setup

On all aircraft, you can configure the LEDs on the bezel to better match the other cockpit instrument lights on the aircraft dimming bus.

➤ To set the dimming bus:

1. Highlight the Brightest dimming voltage selection. An additional button, *Set,* appears below the *Save* button.
2. Adjust the Airplane dimming bus (usually a knob) to the full bright level. Monitor the dimming bus voltage on the MFD below the selection boxes. When at full bright, press *Set* to update the highlighted field.
3. Highlight the Darkest dimming voltage selection and adjust the airplane dimming bus to a level so that the other cockpit instruments are at their lowest brightness level.
4. Press *Set* again to update the Darkest dimming voltage field.

Note: Set the brightness level at the same point where other panel instruments transition from dim (night) to bright (day) operation.

Dimming Bus Checkout

Restart the MFD. Adjust the aircraft dimming bus and verify that the MFD bezel LEDs match the rest of the cockpit instrument lamps and lights.

5.11 Map Heading Source Setup

The MFD can overlay Traffic intruders and Lightning strikes on the Map pages. To use this feature, configure Map Heading with the appropriate source of heading or ground track to match the aircraft wiring. Note that Heading is required to overlay Radar on the Map page. For more information about wiring, see Figure 3, Figure 4, and Figure 5 on page 22. Map Heading Source options include:

Table 25: Map Heading Source Options

Values	Notes
None (Use GPS Track)	The GPS/FMS track will be used as the Map orientation reference.
Entegra	Uses the Avidyne EXP500 Primary Flight Display (PFD) for heading.
GPS/FMS	The EX500/EX600 will use the GPS/FMS sensor ARINC 429 input for heading information. The GPS/FMS system may require supplemental signal converters to generate heading information usable to the EX500/EX600. Refer to GPS/FMS system installation manuals for configuration options.
Synchro	The EX500/EX600 will use ARINC 407 synchro input for heading information.
Stormscope	The EX500/EX600 will use the lightning sensor input for heading information. (WX500 must be configured for synchro)
Traffic	The EX500/EX600 will use the traffic sensor input for heading information. (only present with TAS/TCAS sensors)

The MFD can receive heading data transmitted from one of the following sources:

- Avidyne EXP5000 Primary Flight Display (PFD).
- GPS/FMS (via 429) capable of providing heading information
- L-3 StormScope (via RS -232)
- TAS L-3 SkyWatch (must have 1.6 software level or higher)
- Heading source via Synchro interface

The MFD can receive aircraft ground track from one of the following sources.

- GPS/FMS (via 429)
- GPS (via RS-232)

5.11.1 Setup with EXP5000 PFD as Heading Source

➤ To configure the MFD with the PFD as a heading source:

1. From the Maintenance Mode Page, select Aircraft Setup.
2. Ensure that the Aux Data field on the MFD Aircraft Setup Page is configured to read data from the EXP5000 PFD.
3. Return to the Maintenance Mode Page and select Map Setup.
4. Set the following option:

   Map Heading—Entegra

   When you are done, press *Save*. Press *Cancel* to exit without saving changes.
5. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.11.2 Setup with GPS/FMS as Heading Source

➤ To configure the MFD with the GPS/FMS as a heading source:

1. From the Maintenance Mode Page, select GPS Setup.
2. Ensure that GAMA 429 GPS has been selected in the GPS Setup.
3. Return to the Maintenance Mode Page and select Map Setup.
4. Set the following option:

   Map Heading—GPS/FMS

5. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
6. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.11.3 Setup with StormScope as Heading Source

➤ To configure the MFD with the StormScope as a heading source:

1. From the Maintenance Mode Page, select Lightning Setup.
2. Ensure that StormScope is configured for Synchro or Stepper Stabilization in the Lightning Setup Page.
3. Return to the Maintenance Mode Page and select Map Setup.
4. Set the following option:

   Map Heading—StormScope

5. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
6. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.11.4 Setup with Traffic (TAS) as Heading Source

➤ To configure the MFD with the Traffic as a heading source:

1. From the Maintenance Mode Page, select Traffic Setup.
2. Ensure that TAS is selected as the traffic sensor in the Traffic Setup Page.
3. Return to the Maintenance Mode Page and select Map Setup.
4. Set the following option:

   Map Heading—Traffic (TAS)

5. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
6. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

If SkyWatch is used as the heading source, the SkyWatch software version must be 1.6 or later. SkyWatch software versions 1.5 or earlier can cause the heading to be off by a significant factor.

5.11.5 Setup with Synchro as Heading Source

➤ To configure the MFD with a heading source connected through the Synchro interface:

1. From the Maintenance Mode Page, select Map Setup.
2. Select the following **Map Heading** option:

   Map Heading = Synchro

3. Select the appropriate **Data Valid** option: (See Table 26 for definitions)
   - None
   - Low means valid
   - High means valid

Table 26: Data Valid Options for Synchro

Values	Notes
None	The synchro source does not supply a “heading valid” signal, and the EX500/ EX600 will assume the heading is valid whenever an excitation input is detected.
Low means valid	The Heading Valid input is active when the signal is LOW.
High means valid	The Heading Valid input is active when the signal is HIGH.

4. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
5. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.11.6 Map Orientation with Track

If Heading information is unavailable, Track data can be used for Map, Lightning, and Traffic overlays. Track data comes from the GPS/FMS. Track is the actual direction the aircraft is moving relative to the earth's surface.

Note: Avidyne recommends using a Heading reference for the overlay feature. Only use Track if Heading is not available. Track does not compensate for the “crab” angle of the aircraft.

➤ To configure the MFD with GPS track in place of a heading source:

1. From the Maintenance Mode Page, select Map Setup. The Map Setup Page displays:

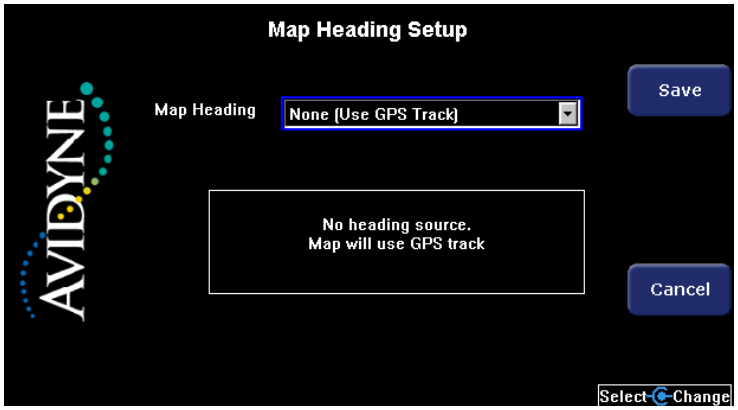


Figure 20: Map Setup Page for Track

2. Set the following option:

   Map Heading—None (Use GPS Track)

3. When you are done, press *Save*. Press *Cancel* to exit without saving changes.
4. Changes do not take effect until the MFD has been restarted. From the Maintenance Mode Page, press *Restart System*.

5.11.7 Map Heading/Track Status

➤ To check the operational status of your heading or track:

1. Return the MFD to normal operation, that is, save all changes and restart the MFD. The GPS/FMS must be on and locked onto a valid position. The selected heading source (GPS, StormScope, SkyWatch, must be on and operational.
2. From the Map Page, look for the following:
   - **Heading—**The box at the top center of the Map display should contain the letters HDG and the value should match the aircraft compass system.
   - **Track—**The box at the top center of the Map display should contain the letters TRK and an appropriate value.

Fault Conditions: The loss of Heading will cause the Center and Forward views of Map to be oriented to Track and the Heading indicator at the top of the Map Page will switch to a Track indicator. Loss of Heading and Track will cause the Heading indicator to display 3 dash lines. The airplane symbol will be replaced by a white “+” sign and the map will be in a north up orientation.

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6 Post-Installation Check

After installing the MFD, you need to perform a post-installation check to ensure that all components are working properly.

This section contains the following information:

- Section 6.1, “System Info Pages” on page 69
- Section 6.2, “Electro-Magnetic Interference (EMI) Check” on page 71
- Section 6.3, “TWX670 Lightning Sensor Strike Test” on page 71
- Section 6.5, “Traffic Test” on page 72
- Section 6.6, “ORBCOMM Satellite Reception (EX500 Only)” on page 72
- Section 6.7, “Broadcast Datalink Satellite Reception” on page 73
- Section 6.8, “Datalink Display Test” on page 74
- Section 6.9, “Magnetic Compass Swing” on page 74

6.1 System Info Pages

Avidyne provides three System Info pages to help you determine if system settings are correct and functioning.

6.1.1 System Info > Datalink Info Page

The Datalink Page provides information about your Datalink set up, as well as UTC time and other information.

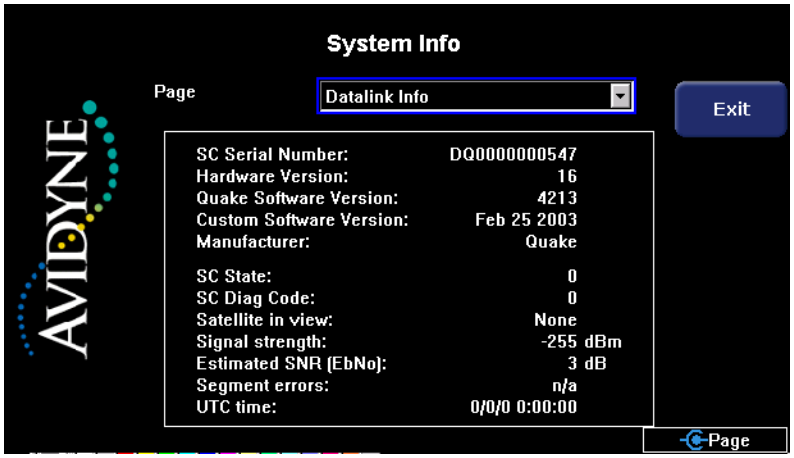

Figure 21: System Info > Datalink Info Page

6.1.2 System Info > Platform Info Page

The Platform Page provides information about the hardware platform and settings of your MFD.

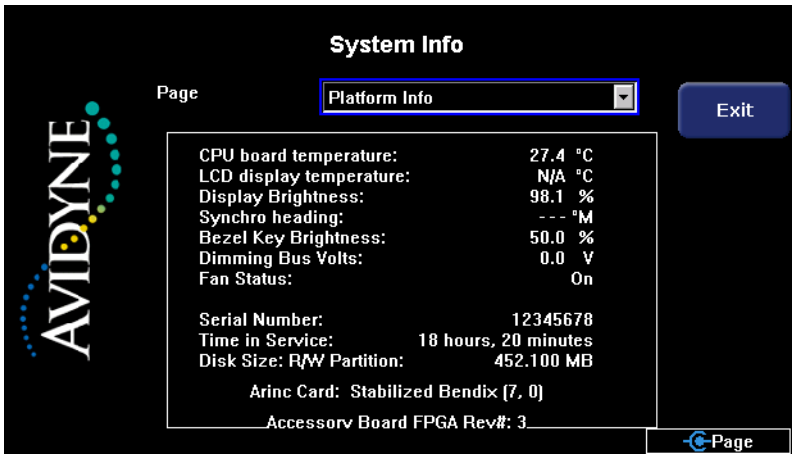

Figure 22: System Info > Platform Info Page

6.1.3 System Info > Port Info Page

The Port Page displays the ports selected for various interfaces during the setup process. Use this page to check your port configurations, described in Section 2.3, “Configuration Options” on page 5.

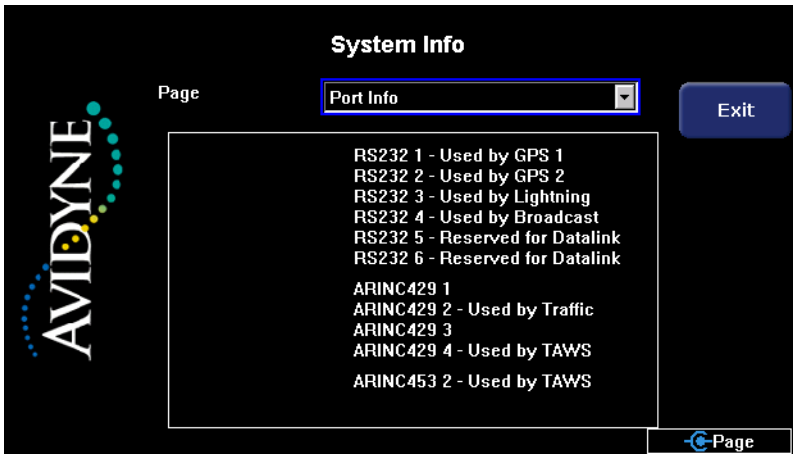
System Info
Page
Port Info
Exit
RS232 1 - Used by GPS 1
RS232 2 - Used by GPS 2
RS232 3 - Used by Lightning
RS232 4 - Used by Broadcast
RS232 5 - Reserved for Datalink
RS232 6 - Reserved for Datalink
ARINC429 1
ARINC429 2 - Used by Traffic
ARINC429 3
ARINC429 4 - Used by TAWS
ARINC453 2 - Used by TAWS
Page

Figure 23: System Info > Port Info Page

6.2 Electro-Magnetic Interference (EMI) Check

The EMI check verifies that there is no electrical interference between the EX500/EX600 MFD and other electronic systems installed in the aircraft. Operating the MFD should not result in Nav flags, constant location lightning strikes from the lightning sensor, noise on COMM channels, or other phenomena.

- **COM Radios**—Scan through radio channels to ensure there is no interference caused by the MFD. Check random frequencies from 118.00 MHz through 136.975 MHz as well as your local ground and tower frequencies to ensure there is no break in squelch due to the installation.
- **GPS**—Ensure that correct position is displayed and that there is no change in satellite signal strength with the MFD powered on and off.
- **Autopilot**—Ensure that autopilot Self Test passes OK with the MFD powered on.
- **Other Instruments**—Verify there is no adverse effect on other instruments with the MFD powered on. Also verify that the MFD functions normally with all other electrical instruments on.

6.3 TWX670 Lightning Sensor Strike Test

With a TWX670 lightning sensor installed and set up, the Maintenance Mode page will have a *Lightning Strike Test* key which enables you to test the lightning sensor.

➤ To perform the Lightning Strike Test:

1. On the Maintenance Mode page, press *Lightning Strike Test*.
2. The Map page opens and displays the following strike test pattern.

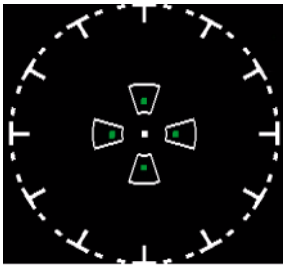

Figure 24: TWX670 Lightning Sensor Strike Test Pattern

3. Verify the following:
   - The display shows four boxes (one at each of the four cardinal directions). A tight cluster of test strikes within each of these boxes is a “pass” condition.
   - One or more boxes lacking a cluster of test strikes is an indication of a “fail” condition.
   - The display shows strikes from thunderstorms as well as test strikes; therefore it is not unusual to see strikes outside the boxes. Look for a cluster of test strikes within each of the boxes to make a pass/fail determination, not at the presence of strikes outside the boxes.
   - A poorly clustered set of test strikes, whether within or outside of the bounding box, may be an indication of noise.

6.4 WX-500 Lightning Sensor Strike Test

With a WX-500 lightning sensor installed and set up, the Maintenance Mode page will have a *Lightning Strike Test* key which enables you to test the lightning sensor.

➤ To perform the Lightning Strike Test:

1. On the Maintenance Mode page, press *Lightning Strike Test*.
2. The Map page opens and displays a single strike on the 15 mile range and 45 degrees relative bearing. If the strike does not appear in that position, there may be a heading source, wiring, or MFD setup problem.
3. Rotate the aircraft to the 4 cardinal compass points and perform the strike test. The strike should display at 45 degrees relative bearing at each heading point

6.5 Traffic Test

After completing all configuration procedures, confirm that the MFD is configured for the correct Traffic sensor.

6.6 ORBCOMM Satellite Reception (EX500 Only)

Two-Way satellite networks transmit very low power signals that the EX500 must receive. If the antenna is not properly installed or if there is excessive electromagnetic interference (such as a nearby radio transmitter, ground power cart, or inadequately grounded avionics), the system will not achieve successful reception.

➤ To assess system performance.

1. Bring the aircraft to an area with the clearest view of the sky to the horizon.
2. Monitor the Datalink Info table (Figure 19), for a few minutes (up to 5) under each of the following conditions:
   - Other Avionics OFF
   - Avionics ON
   - Engines at idle
   - Engines at takeoff power.
3. With a satellite in view, the signal strength and quality should peak above the following values:

Maintenance Mode > System Info > Datalink > Two-Way Datalink Info	**Trip Page > Two-Way Datalink Status**
Signal strength > -118 dBm (-130 is lowest, -100 is highest)	Signal Strength > 4, (scale of 1-10)
Estimated SNR (EbNo) > 10 dB	Signal Quality > 4, (scale of 1-10)
Segment errors = Less than 10%	Message Quality = 10, (scale of 1-10)

4. If the expected reception levels are not achieved, check for possible causes and solutions:

Possible Cause	Possible Solution
The antenna field of view is obstructed.	The antenna field of view is obstructed.
There is a local source of electromagnetic interference:	■ Try shutting off any nearby sources (such as VHF radios, alternators, magnetos, ground power cart). ■ Relocate the aircraft away from potential nearby sources. ■ Check electrical connections and grounds. ■ There is poor satellite coverage. Try again after fifteen minutes. ■ Check the antenna and cable for proper installation. ■ Check the connection between the antenna and its ground plane.

6.7 Broadcast Datalink Satellite Reception

The broadcast satellite network transmits signals that are received by an external Datalink receiver, which sends the information on to the MFD through a serial connection. If the broadcast Datalink antenna is not properly installed, or if there is excessive electromagnetic interference (such as a nearby radio transmitter or inadequately grounded electronics), the system will not achieve consistent reception.

➤ To assess system performance.

1. Bring the aircraft to an area that has as few obstacles to line-of-sight viewing to the southern horizon as possible.

2. Select the Trip page on the EX500/EX600.

3. Press *Display* until Broadcast (down-pointing arrow) Status is selected.

4. The Signal Quality will be reported as Good, Marginal, Weak, or None. If the Broadcast Receiver is working, the antenna and cabling are correct, and the aircraft is in view of at least one Broadcast datalink satellite, the Signal Quality will be “Good” and the Receiver ID will be reported.

5. If the Signal Quality is not reported as Good, check for possible causes and solutions:

Possible Cause	Possible Solution
The antenna field of view is obstructed.	Try moving or rotating the aircraft. **Note:** If rotation works, the antenna location on the aircraft may not be optimal
There is a local source of electromagnetic interference.	■ Try shutting off any nearby sources (such as VHF radios, alternators and magnetos). ■ Relocate the aircraft away from potential nearby sources. ■ Check electrical connections to ensure there is no improper grounding. ■ The antenna and cable are not properly installed. ■ The antenna may not be properly connected to the ground plane. ■ The cable may not be properly connected to the antenna or the receiver.

6. Service Level should display either *Aviator* or *Aviator Lite,* depending on your level of service.

- If *Activation* displays, verify that a Broadcast subscription has been set up with the Broadcast Service provider.

- If Deactivation displays, contact XM.

See www.avidyne.com for additional information.

6.8 Datalink Display Test

After completing all configuration procedures, confirm that Datalink information displays on the EX500/EX600 for all installed Datalink devices.

6.9 Magnetic Compass Swing

After installation and EMI checks are complete, perform a magnetic compass “swing” in accordance with the aircraft installation manual for updating the heading correction card in accordance with 14 CFR 23.1327 and 23.1547.

7 EX500 General Maintenance

This section briefly describes maintenance procedures that are done by the aircraft owner (or pilot). This information is also available in the *EX500/EX600 Multi-Function Display Pilot's Guide*.

This section contains the following information:

- Section 7.1, Cleaning the EX500/EX600 Screen
- Section 7.2, MFD Data Updates

7.1 Cleaning the EX500/EX600 Screen

If your EX500/EX600 screen should become dirty due to fingerprints or dust, clean the screen using the following materials and methods:

- A clean, soft lint free cloth such as 3M Ultra-Brite Cloth # 2011 or similar.
- A cleaning solution composed of de-ionized water or isopropyl alcohol (IPA).

  Always apply the cleaning solution directly onto the cloth. **Never** spray cleaner directly onto the screen.

Use caution when using IPA as it is flammable.

Using any other chemicals or materials voids the warranty.

The EX500/EX600 screen is made of a plastic film that is vulnerable to scratches, damage by sharp articles or improper cleaners. Use care when cleaning.

7.2 MFD Data Updates

Avidyne makes use of two different types of data that can optionally be uploaded to or downloaded from your EX500/EX600:

- **NavData**—For the Map Page, Avidyne uses NavData from Jeppesen Sanderson, Inc. it is your duty as pilot in command to ensure that the data you fly with remains up to date.
- **CMax™ Chart Data**—An optional Avidyne feature that allows you to view JeppView chart data on your EX500/EX600.

  Additionally, NOAA Obstacle Data and Terrain data are provided. NOAA Obstacle Data is automatically updated as part of NavData; Terrain data can only be changed by Avidyne Authorized Flightmax Service Center.

Note: For Release 3 and later, you can use a Zip Drive or USB Flash Memory Drive to move data between your PC and the EX500/EX600.

➥ The Zip Drive or USB Flash Memory Drive are referred to here as a *Portable USB Device*.

For more information about the databases, and about loading data from your PC to a Portable USB Device, see the *Avidyne Data Update Guide*.

This section describes moving data from your Portable USB Device to the EX500/EX600.

If using a Zip Drive Dataloader:

- Allowing the portable Zip Drive to dangle by the cable can result in damage to your MFD, or the Drive, as well as a data load failure.
- Do not insert the Zip disk into the Zip Drive until the initial FlightMax logo screen displays on the MFD. The disk may be damaged if it is already in the Zip Drive when power is applied.
- After loading the CMax data into your MFD, wait until the disk is ejected from the drive before unplugging the Drive, or powering off the MFD. Unplugging the Zip Drive with the disk still engaged may cause damage to the disk.

If using a USB Flash Memory:

- USB Flash Memory is only available for software part numbers 530-00193-( ) and later releases.
- Avidyne strongly suggests that, to avoid confusion, you reserve a USB Flash Memory Drive solely for EX500/EX600 database transfers. If you use both NavData and CMax, keep two USB Flash Memory Drives, one for each update
- After uploading data, do not remove the USB Flash Memory Drive until you see and acknowledge the regular EX500/EX600 Startup screen. A system reboot may occur if you remove the USB flash drive before the startup screen displays

Note: For either media type, ensure that there are no other programs on the Zip disk or USB Flash Memory Drive. Additionally, the Zip disk must be in "FAT" format to successfully download data to your EX500/EX600. For more information, see the *Avidyne Data Update Guide.*

Note: When removing the rubber cap from the data port, pull the cap gently **from the right (EX500) or from the top (EX600)** until it pops out. Make sure the cap is all the way out before plugging anything into the USB port.

Do not tug on the tab on the left side of the cap (EX500) or the bottom of the cap (EX600); this can separate the cap from the EX500/EX600 bezel.

7.2.1 Loading NavData (the Navigation Database)

Your new EX500/EX600 will be loaded with an up-to-date navigation database. Updates to the EX500/EX600 NavData database are available from Jeppesen Sanderson, Inc. every 28 days and can be purchased either individually or on a subscription basis.

Once you have downloaded the Nav from your PC to a Portable USB Device, as described in the *Avidyne Data Update Guide*, you will need to upload the data to your EX500/EX600.

➤ To load NavData to your EX500/EX600:

1. Bring the Portable USB Device to the EX500/EX600 at the aircraft.
2. Turn power OFF to the EX500/EX600.
3. Connect the data source to the EX500/EX600:
   - If using a USB Flash Memory Drive, plug it into the data port on the front of the EX500/EX600.

- If using a Zip Drive Dataloader, connect one end of the cable to the Zip Drive and the other end to the EX500/EX600 data port Do not insert the Zip disk into the Zip Drive until after you turn on the MFD (in step 4).

Note: Ensure that the Zip Drive is supported and not dangling by the cable. Letting the Zip Drive dangle can cause permanent damage to the data port. It can also cause an intermittent connection, which will result in an unsuccessful data update

4. Turn on the MFD. If you are using a Zip Drive, insert the Zip disk into the Zip Drive when the initial FlightMax logo screen displays.

Note: If the regular start screen displays, the EX500/EX600 did not detect the Portable USB Device. Check the connection between the Portable USB Device and the EX500/EX600, then restart the procedure.

5. Press *Proceed*. Do not turn off the EX500/EX600 or disconnect the cable during a data load.The data load is complete when the regular startup Page displays.
6. After the startup Page displays, turn off power to the EX500/EX600, remove your Portable USB Device, and then turn the EX500/EX600 power back on.
7. This step ensures that all data has been checked in self-test and the MFD is ready for use.
8. Store the Portable USB Device in a safe place.

7.2.2 Loading CMax Chart Data

Once you have downloaded the CMax data from your PC to a Portable USB Device, as described in the *Avidyne Data Update Guide*, you will need to upload the data to your EX500/EX600.

➤ To load CMax Data to your EX500/EX600:

1. With the MFD power OFF:
   - If using a USB Flash Memory Drive, plug it into the data port on the front of the EX500/EX600.
   - If using a Zip Drive Dataloader, connect one end of the cable to the Zip Drive and the other end to the EX500/EX600 data port Do not insert the Zip disk into the Zip Drive until after you turn on the MFD (in step 2).

Note: Ensure that the Dataloader is supported and not dangling by the cable. Letting the Dataloader dangle can cause permanent damage to the data port. It can also cause an intermittent connection, which will result in an unsuccessful data update.

2. Turn on the MFD. If you are using a Zip Drive, insert the Zip disk into the Zip Drive when the initial FlightMax logo screen displays.
3. The Dataloader Page displays.

➥ If this is the first-ever update, you may see a warning that you are about to load older data than the MFD already contains. This is because the preloaded demo charts expire in the year 2020, so the warning message is normal.

Press *Proceed* to start the chart data load.

4. The Dataloader Page shows the progress as it loads the data into the MFD. After loading the data, the Dataloader performs an integrity check on the data and displays a successful data load message if all data is valid.
5. When the operation is complete, the EX500/EX600 will continue to the normal startup Page.
6. At this point, turn off power to the EX500/EX600, remove your Portable USB Device, and then turn the EX500/EX600 power back on.

   This step ensures that all data has been checked in self-test and the MFD is ready for use
7. Confirm the valid dates of the Chart data as reported on the Startup Screen.
8. Go to the Chart Page and select a chart from an airport known to be in your subscription coverage area. Confirm that the chart is available.
9. Store the Portable USB Device in a safe place.

8 Avidyne Technical Support and Service

8.1 Technical Support

Avidyne's web site contains information that may assist the operator and installer with questions or problems with their Avidyne product.

www.avidyne.com

Technical support questions may be submitted, 24 hours per day, via the following.

Email: techsupport@avidyne.com
Fax: 781-402-7599
Voice: 888-723-7592

An Avidyne Technical Support Representative will respond as soon as possible. Avidyne business hours are:

- Monday through Thursday: 8:00 AM to 8:30 PM Eastern Time
- Friday: 8:00 AM to 5:30 PM Eastern Time

Please include the part number, revision number and serial number of the unit in all correspondences. For problem reporting, please provide as many details associated with the problem as possible.

8.2 Service

EX500/EX600 system service is performed at the Avidyne Service Center, and includes a complete checkout.

Before you return the unit for service, contact Avidyne at 888-723-7592 to obtain a Return Merchandise Authorization (RMA) number.

Securely pack the unit in the original Avidyne shipping carton, write the RMA number on the outside of the carton, and return it to the address provided by the Avidyne Customer Service Representative.

Include your name, complete shipping address, daytime telephone number, a complete description of the problem, the desired return date, and shipping method.

If the original shipping carton or other suitable foam packing is not available, contact Avidyne to arrange for packaging materials. Avidyne is not responsible for damage due to poorly packaged returns.

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9 AC 20-68B Recommended Radiation Safety

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C.

PURPOSE. This circular sets forth recommended radiation safety precautions to be taken by personnel when operating airborne weather radar on the ground.

CANCELLATION. AC20-68, dated April 11, 1975, is cancelled.

RELATED READING MATERIAL:

Barnes and Taylor, Radiation Hazard and Protection (London: George Newnes Limited, 1963), p.211.

U.S. Department of Health, Education and Welfare, Public Health Service, Consumer Protection and Environmental Health Service, “Environmental health microwaves, ultraviolet radiation and radiation from lasers and television receivers - An Annotated Bibliography,” FS 2.300: RH-35, Washington, U.S. Government Printing Office, pp. 56-57.

Mumford. W.W., “Some technical aspects of microwave radiation hazards,” Proceedings of the IRE, Washington, U.S. Government Printing Office, February 1961, pp. 427-447.

BACKGROUND. Dangers from ground operation of airborne weather radar include the possibility of human body damage and ignition of combustible material by radiated energy. Low tolerance parts of the body include the eyes and testes.

PRECAUTIONS. Management and supervisory personnel should establish procedures for advising personnel of dangers from operating airborne weather radars on the ground. Precautionary signs should be displayed in affected areas to alert personnel of ground testing.

General.

- Airborne weather radar should be operated on the ground only by qualified personnel.
- Installed airborne radar should not be operated while the aircraft is in a hangar or other enclosure unless the radar transmitter is not operating, or the energy is directed toward an absorption shield which dissipates the radio frequency energy. Otherwise, radiation within the enclosure can be reflected throughout the area.

Body Damage. To prevent possible human body damage, the following precautions should be taken.

- Personal should never stand nearby and in front of a radar antenna which is transmitting. When the antenna is not scanning, the danger increases.
- A recommended safe distance from operating airborne weather radars should be established. A safe distance can be determined by using the equation in Appendix 1 or the graphs of figures 1 and 2. This criterion is now accepted by many industrial organizations and is based on limiting exposure of humans to an average power density not greater than 10 milliwatts per square centimeter.
- Personnel should be advised to avoid the end of an open waveguide unless the radar is turned off.
- Personnel should be advised to avoid looking into the waveguide, or into the open end of a coaxial connector or line connector to a radar transmitter output, as severe eye damage may result.
- Personnel should be advised that when high power radar transmitters are operated out of their protective cases, X-rays may be emitted. Stray X-rays may emanate from the glass envelope type pulser, oscillator, clipper, or rectifier tubes, as well as magnetrons.

Combustible Materials. To prevent possible fuel ignition, an installed airborne weather radar should not be operated while an aircraft is being refueled or defueled.

M.C. BEARD

Director of Airworthiness

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Appendix A: Environmental Qualification Forms

RTCA/DO-160E ENVIRONMENTAL QUALIFICATION FORM

NOMENCLATURE	Multi-Function Display
PART NO:	700-00007-(), EX500 & 700-00167-(), EX600
MANUFACTURER:	AVIDYNE CORPORATION
ADDRESS:	55 OLD BEDFORD ROAD, LINCOLN, MA 01773

CONDITIONS	RTCA/DO-160E PARAGRAPH	700-00007-() CONDUCTED TEST CATEGORY	700-00167-() CONDUCTED TEST CATEGORY
TEMPERATURE	4.5	D1	D1
INFLIGHT LOSS OF COOLING	4.5.4	V	V
ALTITUDE	4.6.1	D1	D1
DECOMPRESSION	4.6.2	D1	A1
OVERPRESSURE	4.6.3	D1	A1
TEMPERATURE VARIATION	5.0	B	B
HUMIDITY	6.0	A	A
OPERATIONAL SHOCK	7.2	B	B & D
CRASH SAFETY	7.3	B	B & D
VIBRATION	8.0	Cat. S Curves M	Cat. S Curves M and B & Cat. U, Curves G
EXPLOSION	9.0	X (Not Tested)	X (Not Tested)
WATERPROOFNESS	10.0	X (Not Tested)	X (Not Tested)
FLUIDS SUSCEPTIBILITY	11.0	X (Not Tested)	X (Not Tested)
SAND AND DUST	12.0	X (Not Tested)	X (Not Tested)
FUNGUS	13.0	X (Not Tested)	X (Not Tested)
SALT SPRAY	14.0	X (Not Tested)	X (Not Tested)
MAGNETIC EFFECT	15.0	Z	Z
POWER INPUT	16.0	B	B
VOLTAGE SPIKE	17.0	A	B
AUDIO FREQUENCY CONDUCTED SUSCEPTIBILITY	18.0	Z	B
INDUCED SIGNAL SUSCEPTIBILITY	19.0	AC	AC
RADIO FREQUENCY SUSCEPTIBILITY	20.0	D (Conducted), Z (Radiated)	D
EMISSION OF RADIO FREQUENCY ENERGY	21.0	M	M
LIGHTNING INDUCED TRANSIENT SUSCEPTIBILITY	22.0	A3E3X (Signal Inputs), A4E4X (Power Input)	A3E3X (Signal Inputs), A4E4X (Power Input)
LIGHTNING DIRECT EFFECTS	23.0	X (Not Tested)	X (Not Tested)
ICING	24.0	X (Not Tested)	X (Not Tested)
ELECTROSTATIC DISCHARGE	25.0	A	A
FIRE/FLAMMABILITY	26.0	X (Not Tested)	X (Not Tested)

Appendix B: Authorized TSOs

Table 27: Authorized TSOs

Applicable TSO	Description
TSO-C63c	Airborne Weather and Ground Mapping Pulsed Radars
TSO-C110a	Airborne Passive Thunderstorm Detection Equipment
TSO-C113	Airborne Multipurpose Electronic Displays
TSO-C118	Traffic Alert and Collision Avoidance System (TCAS) Airborne Equipment, TCAS I
TSO-C147	Traffic Advisory System (TAS) Airborne Equipment
TSO-C157	Aircraft Flight Information Services-Broadcast (FIS-B) Data Link Systems and Equipment
TSO-C165	Electronic Map Display Equipment for Graphical Depiction of Aircraft Position

Table 28 below lists the TSO deviations that have been granted for the applicable TSOs.

Table 28: TSO Deviations

TSO	Description of Deviation
TSO-C157	The EX500/EX600 MFD provides a simple scaling and smoothing mechanism to overlay NEXRAD on a variable range moving map in a distinctive, easy to interpret format. At large map ranges, small areas of high-intensity NEXRAD may not be displayed.
	On the map page, the MFD is capable of displaying a number of weather data products, including NEXRAD, graphical METARs, SIGMET and AIRMET areas, and various forecast products. Of these, only NEXRAD displays product age.
TSO-C165	Curved flight plans are not displayed if connected to a GNS-400/500 navigator via RS232.

For some of the functions for which TSO approval has been granted, the MFD only provides part of the functionality covered by the TSO. Table 29 below lists those partial function TSOs along with the portion of the TSO functionality provided by the MFD.

Table 29: Partial Function TSOs

TSO	Function Performed by MFD
TSO-C63c	Display function only
TSO-C110a	Display functions only
TSO-C118	Display functions only
TSO-C147	Display functions only
TSO-C157	Airborne display functions only

Appendix C: STC Permissions

C.1 EX500

Avidyne Corporation hereby grants permission to all National Aviation Authority (FAA, CAA, JAA) approved installers to use data from all STCs and amendments Avidyne has received to modify aircraft. Copies of the STCs and amendments from the STC Master Document List are available upon request or at the Avidyne web site Technical Publication page. The latest version of the associated AVMFC-076 Avidyne 700-0007-() MFD (EX500) Approved Model List may be accessed by authorized dealers at www.avidyne.com.

C.2 EX600

Avidyne Corporation hereby grants permission to all National Aviation Authority (FAA, CAA, JAA) approved installers to use data from all STCs and amendments Avidyne has received to modify aircraft. Copies of the STCs and amendments from the STC Master Document List are available upon request or at the Avidyne web site Technical Publication page. The latest version of the associated AVMFC-509 Avidyne 700-00167-() EX600 MFD Approved Model List may be accessed by authorized dealers at www.avidyne.com.

Appendix D: EX500, EX600, Tray & Panel Dimensions

D.1 EX600 and Fixed-Wing Tray Dimensions

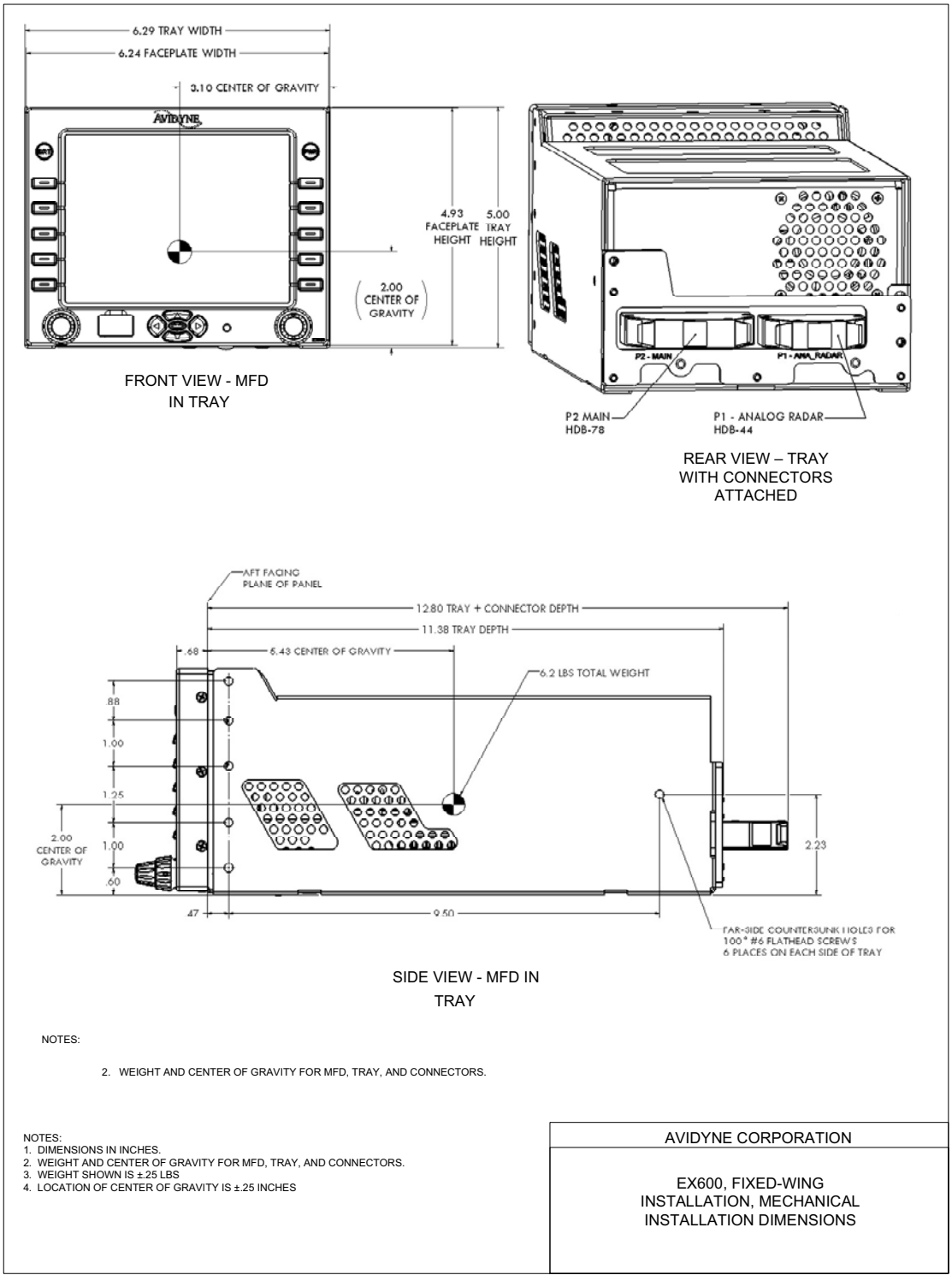


Figure 25: EX600 and Fixed-Wing Tray Dimensions

D.2 EX600 and Helicopter Tray Dimensions

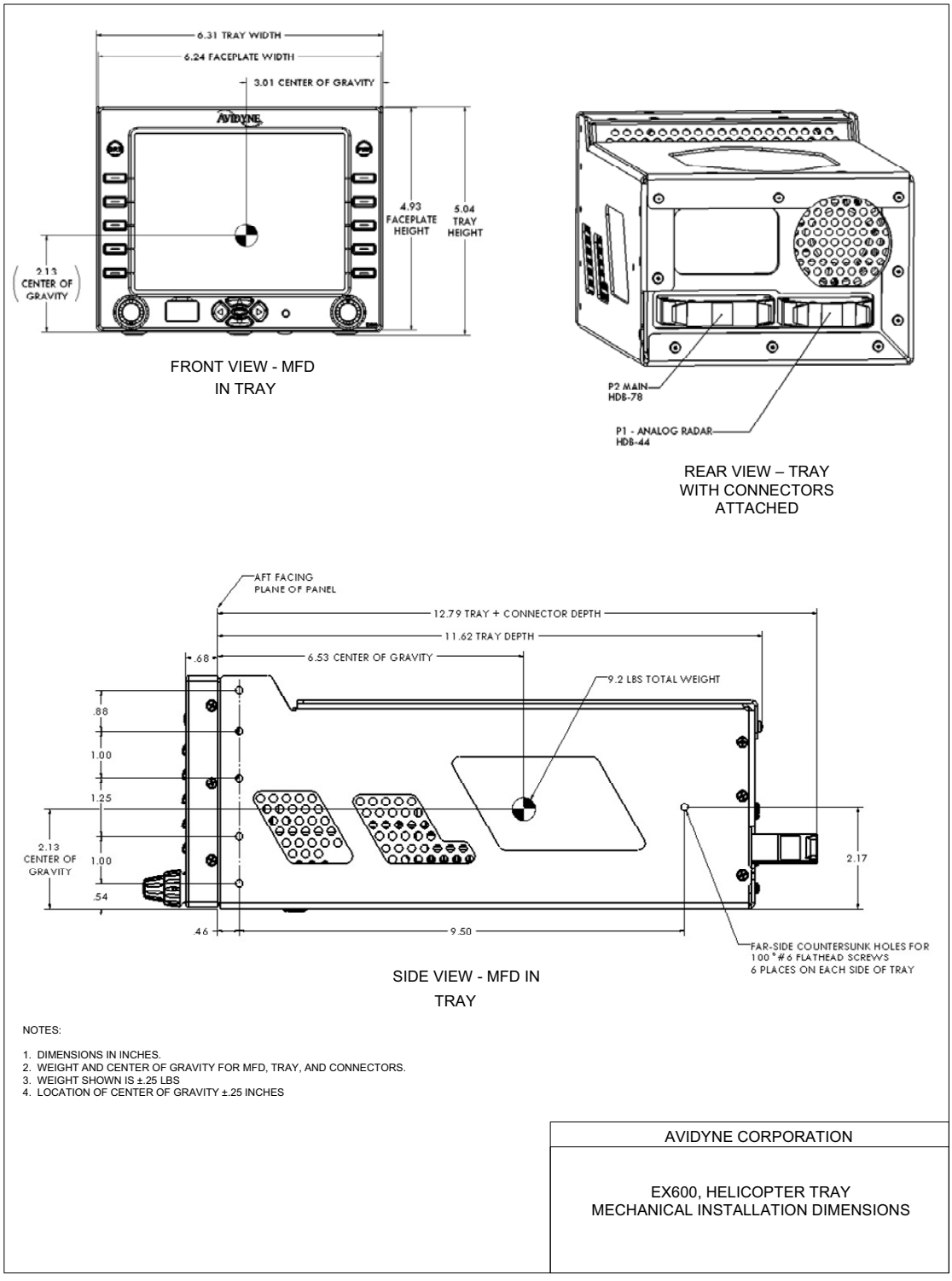


Figure 26: EX600 and Helicopter Tray Dimensions

D.3 EX600 Panel Cut-Out Dimensions

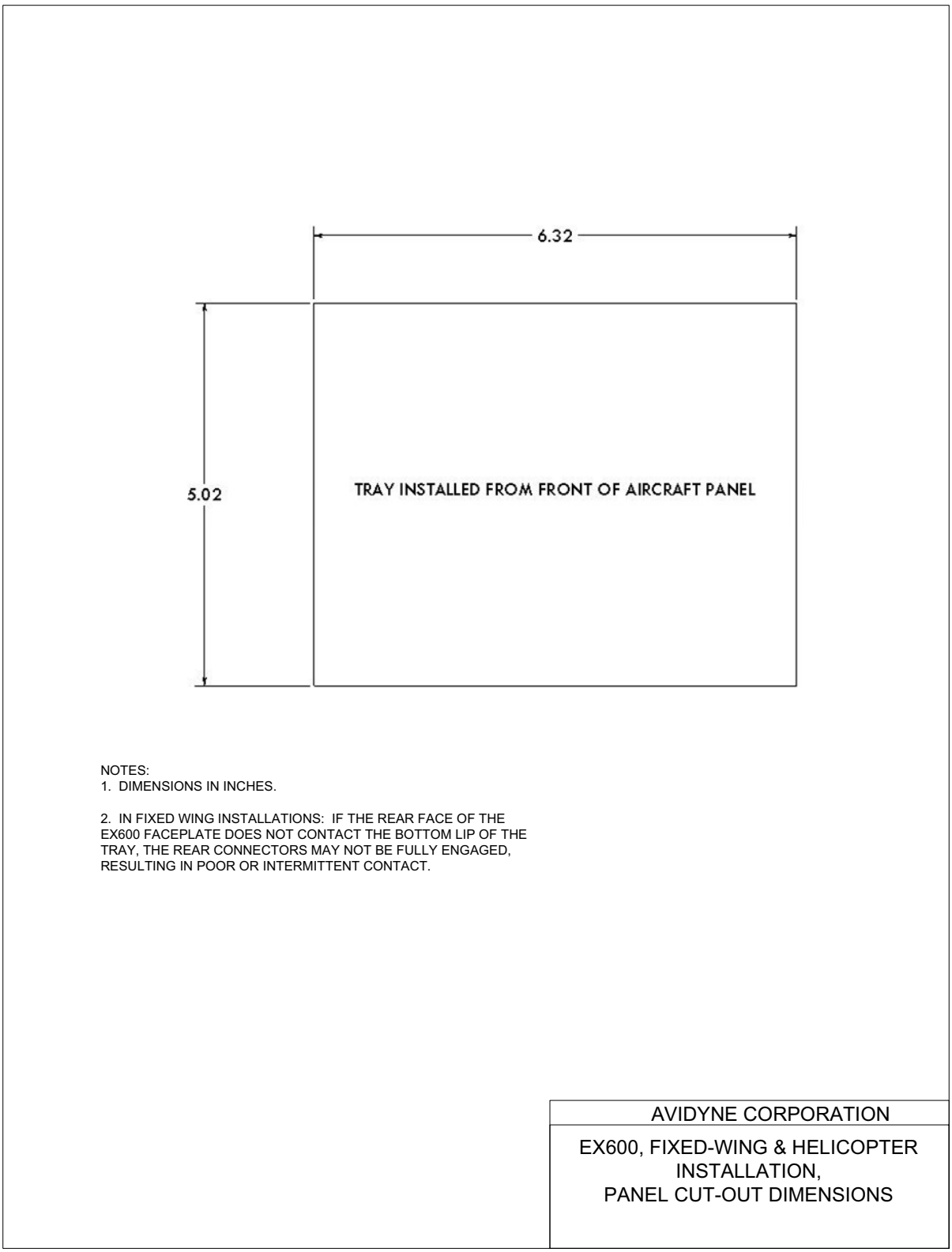

6.32
5.02
TRAY INSTALLED FROM FRONT OF AIRCRAFT PANEL
NOTES:
1. DIMENSIONS IN INCHES.
2. IN FIXED WING INSTALLATIONS: IF THE REAR FACE OF THE EX600 FACEPLATE DOES NOT CONTACT THE BOTTOM LIP OF THE TRAY, THE REAR CONNECTORS MAY NOT BE FULLY ENGAGED, RESULTING IN POOR OR INTERMITTENT CONTACT.
AVIDYNE CORPORATION
EX600, FIXED-WING & HELICOPTER INSTALLATION,
PANEL CUT-OUT DIMENSIONS

Figure 27: EX600 Panel Cut-Out Dimensions

D.4 EX600 Fixed-Wing Tray Support Structure Panel

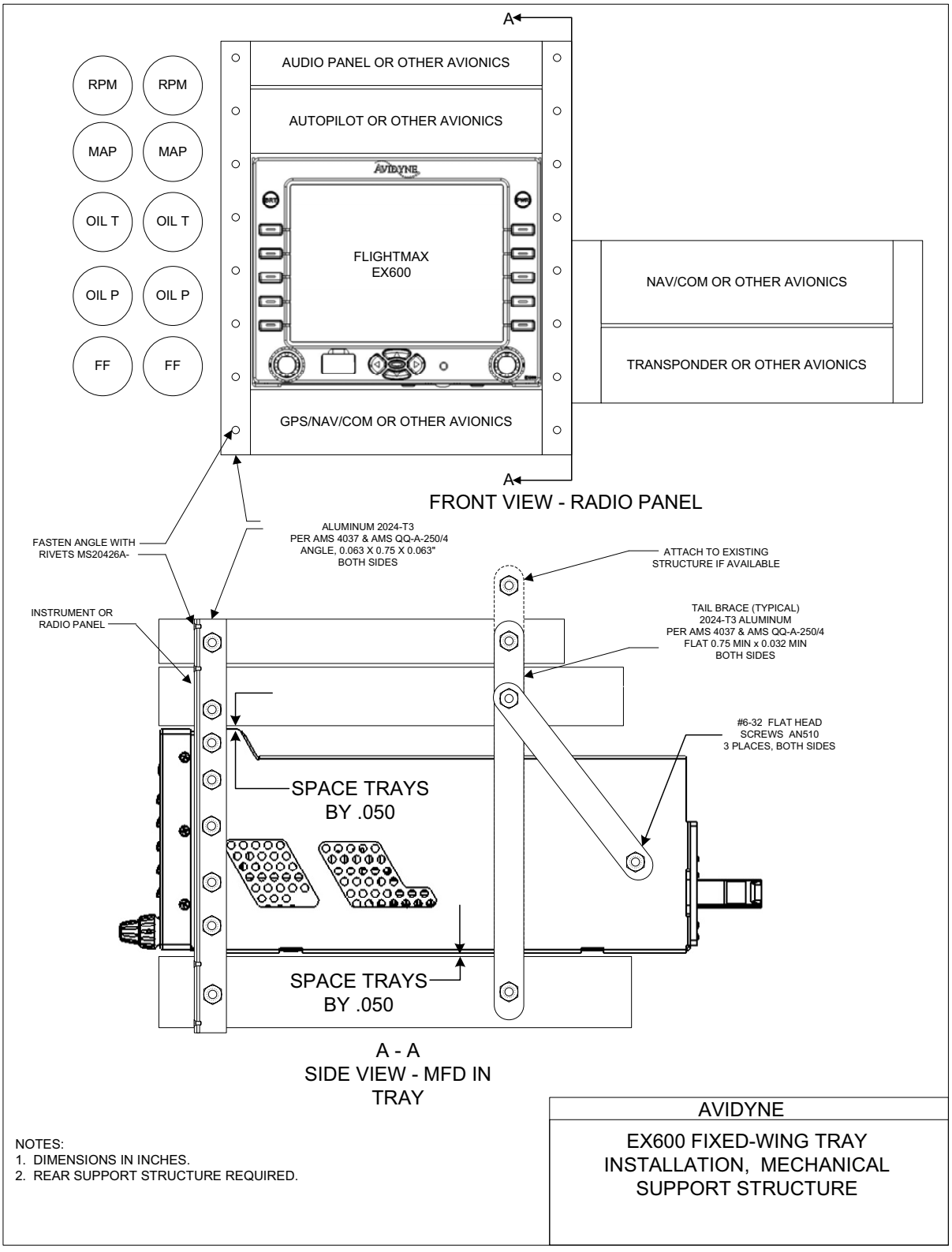


Figure 28: EX600 Fixed-Wing Tray Support Structure Panel

D.5 EX600 Helicopter Tray Support Structure Panel

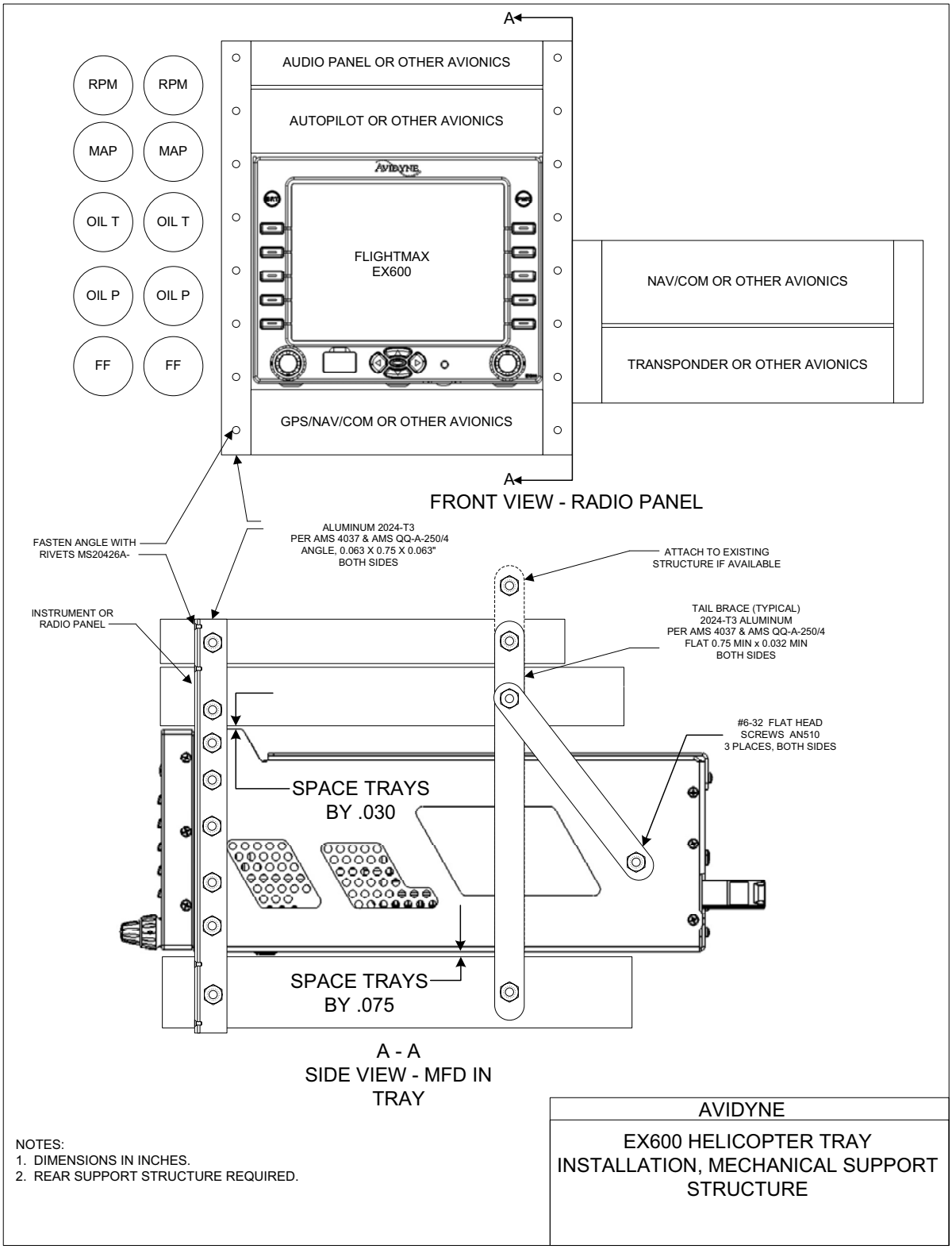


Figure 29: EX600 Helicopter Tray Support Structure Panel

D.6 EX500 and Tray Dimensions

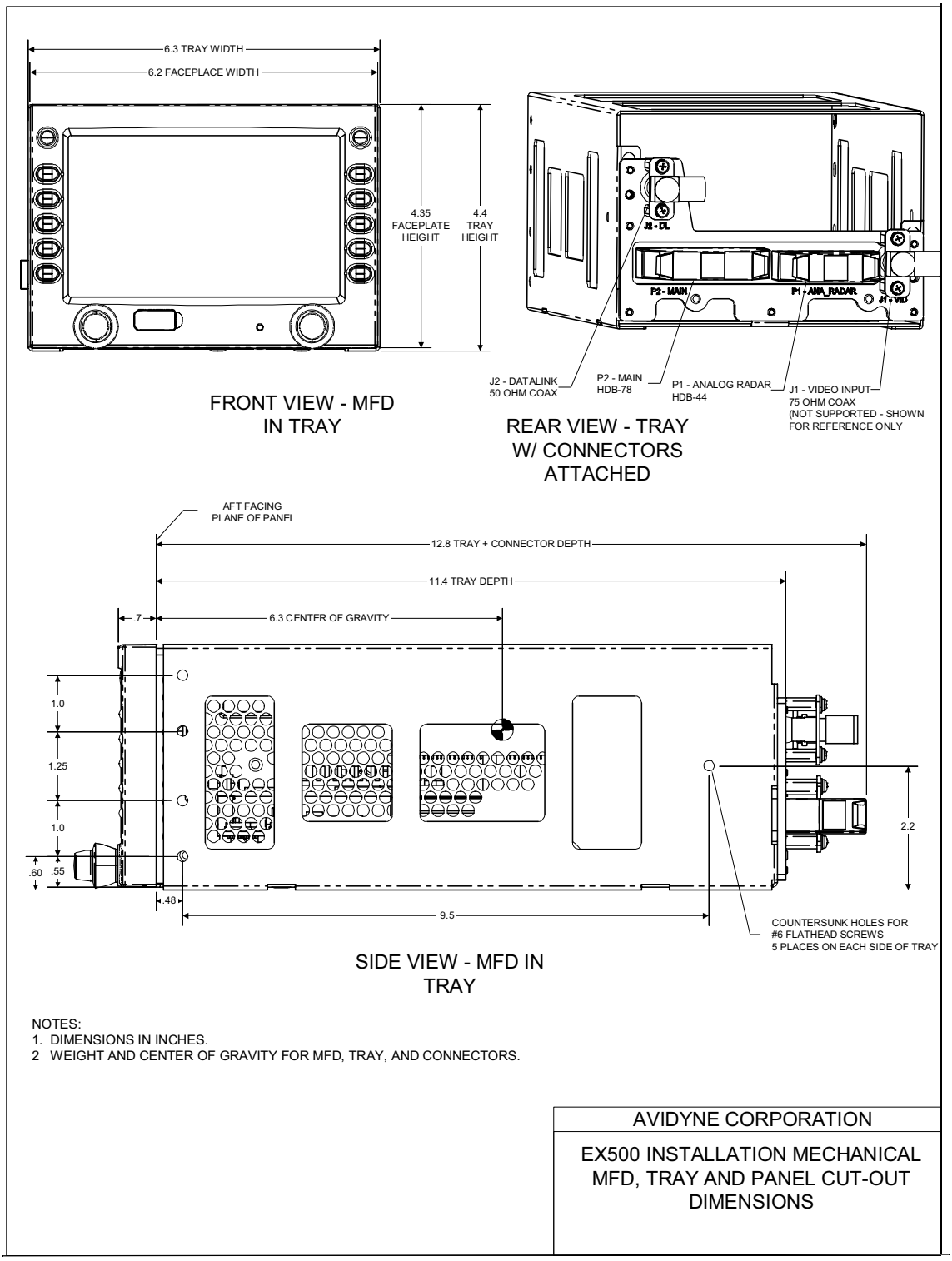

6.3 TRAY WIDTH
6.2 FACEPLACE WIDTH
4.35 FACEPLATE HEIGHT
4.4 TRAY HEIGHT
FRONT VIEW - MFD IN TRAY
J2 - DATALINK 50 OHM COAX
P2 - MAIN HDB-78
P1 - ANALOG RADAR HDB-44
J1 - VIDEO INPUT 75 OHM COAX (NOT SUPPORTED - SHOWN FOR REFERENCE ONLY
REAR VIEW - TRAY W/ CONNECTORS ATTACHED
AFT FACING PLANE OF PANEL
12.8 TRAY + CONNECTOR DEPTH
11.4 TRAY DEPTH
.7
6.3 CENTER OF GRAVITY
1.0
1.25
1.0
.60
.55
.48
9.5
2.2
COUNTERSUNK HOLES FOR #6 FLATHEAD SCREWS 5 PLACES ON EACH SIDE OF TRAY
SIDE VIEW - MFD IN TRAY
NOTES:
1. DIMENSIONS IN INCHES.
2 WEIGHT AND CENTER OF GRAVITY FOR MFD, TRAY, AND CONNECTORS.
AVIDYNE CORPORATION
EX500 INSTALLATION MECHANICAL MFD, TRAY AND PANEL CUT-OUT DIMENSIONS

Figure 30: EX500 and Tray Dimensions

D.7 EX500 Panel Cut-Out Dimensions

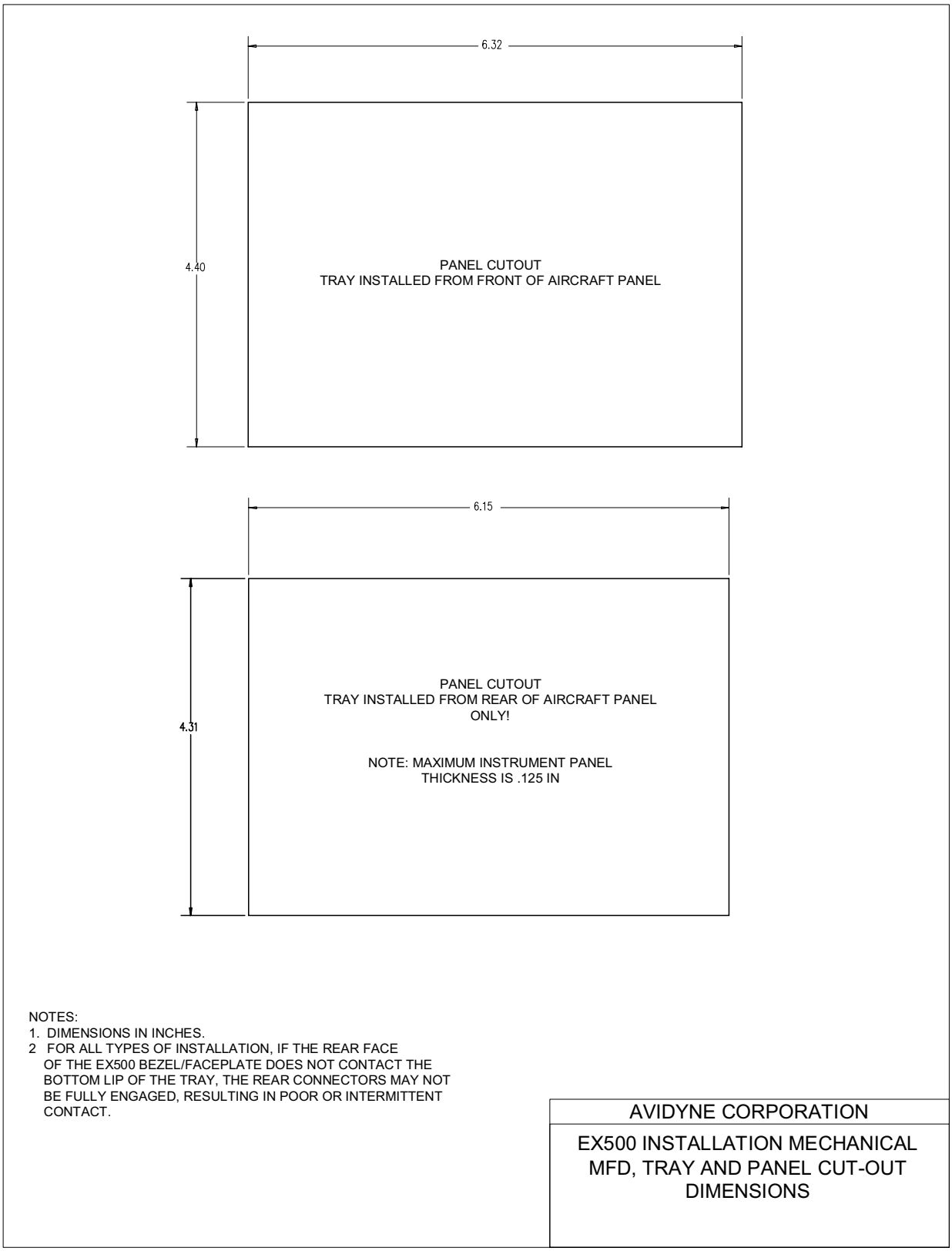

6.32
4.40
PANEL CUTOUT
TRAY INSTALLED FROM FRONT OF AIRCRAFT PANEL
6.15
4.31
PANEL CUTOUT
TRAY INSTALLED FROM REAR OF AIRCRAFT PANEL
ONLY!
NOTE: MAXIMUM INSTRUMENT PANEL
THICKNESS IS .125 IN
NOTES:
1. DIMENSIONS IN INCHES.
2 FOR ALL TYPES OF INSTALLATION, IF THE REAR FACE OF THE EX500 BEZEL/FACEPLATE DOES NOT CONTACT THE BOTTOM LIP OF THE TRAY, THE REAR CONNECTORS MAY NOT BE FULLY ENGAGED, RESULTING IN POOR OR INTERMITTENT CONTACT.
AVIDYNE CORPORATION
EX500 INSTALLATION MECHANICAL
MFD, TRAY AND PANEL CUT-OUT
DIMENSIONS

Figure 31: EX500 Panel Cut-Out Dimensions

D.8 EX500 Tray Support Structure Panel

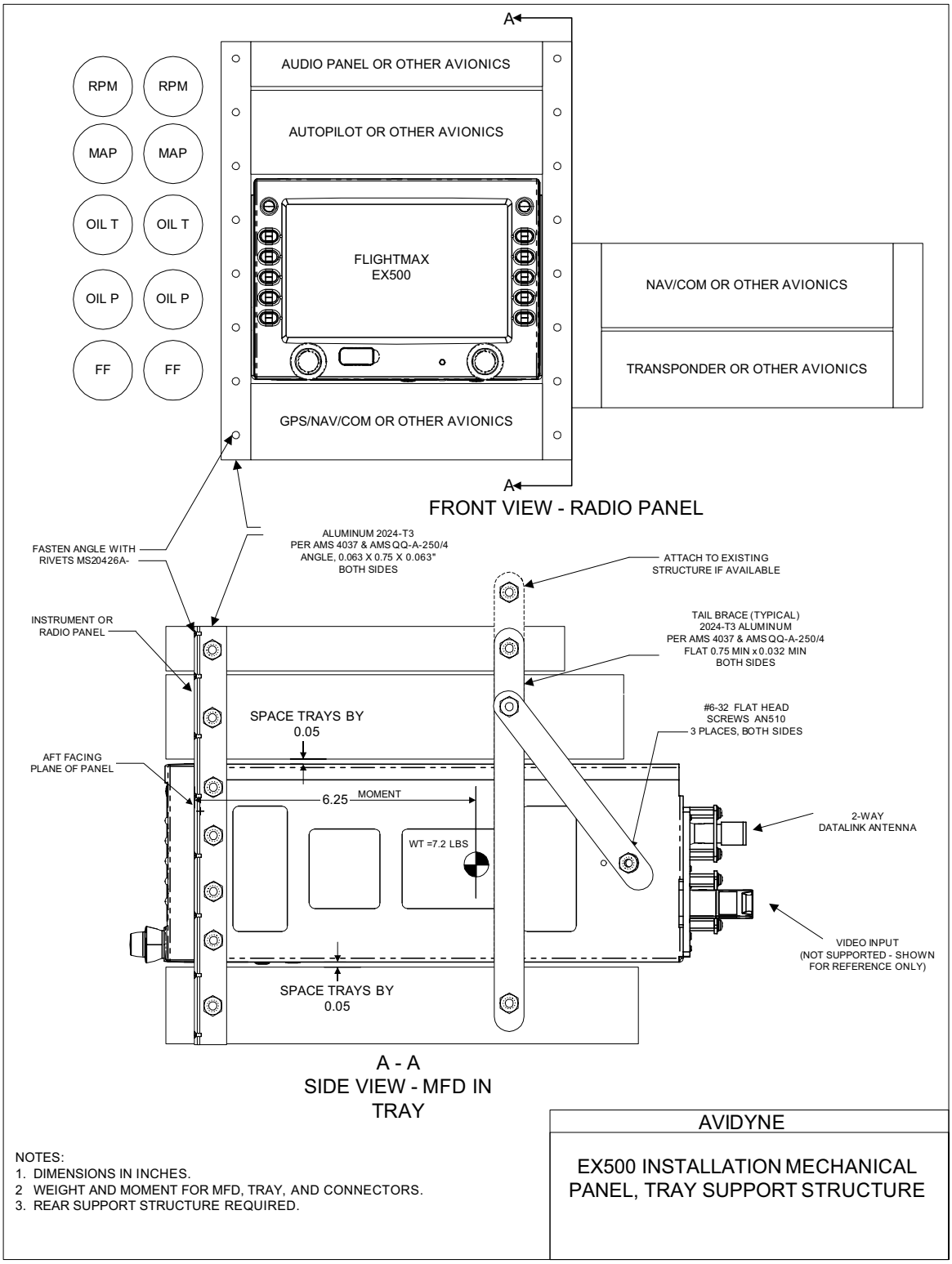
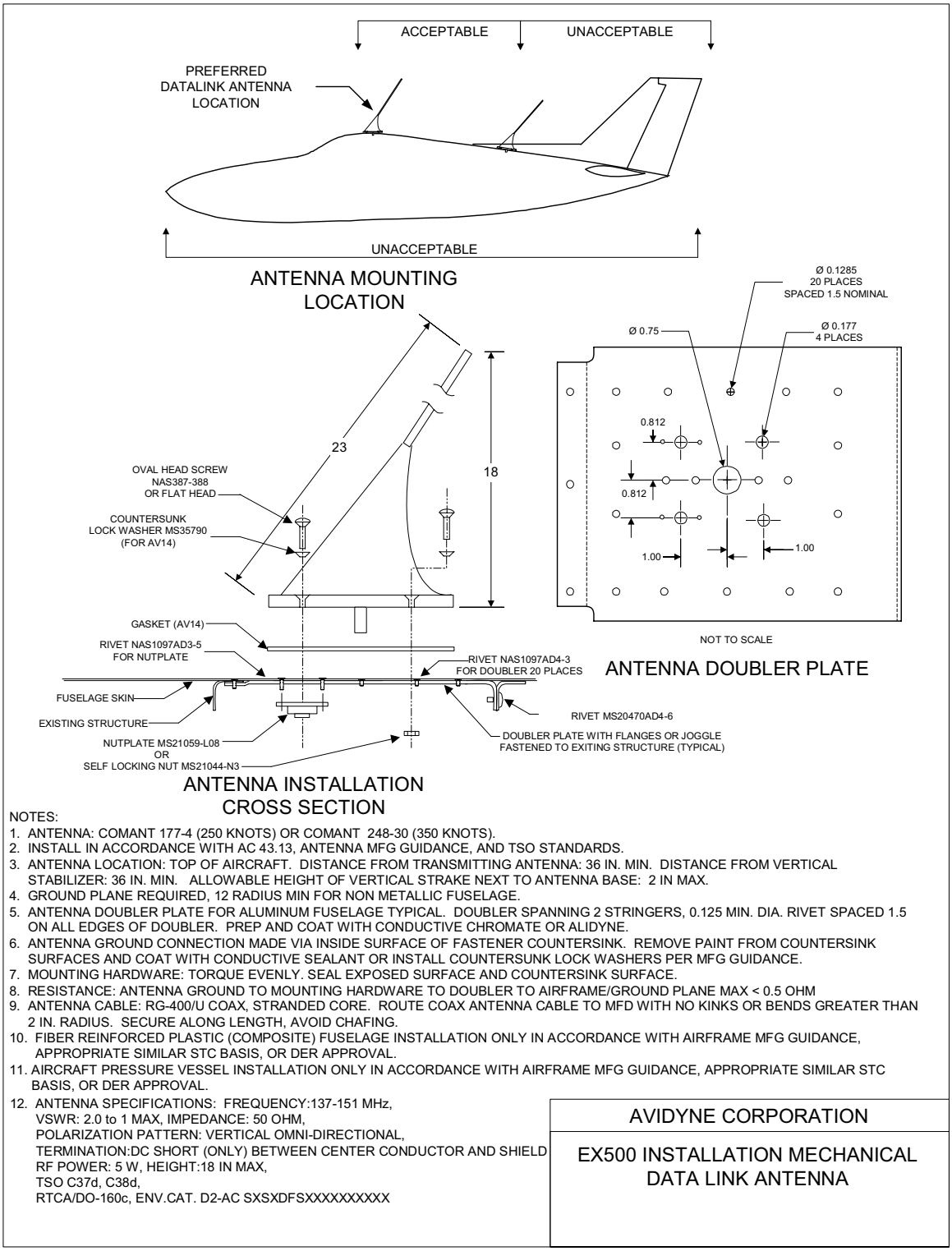

A
AUDIO PANEL OR OTHER AVIONICS
AUTOPILOT OR OTHER AVIONICS
RPM
RPM
MAP
MAP
OIL T
OIL T
OIL P
OIL P
FF
FF
FLIGHTMAX
EX500
NAV/COM OR OTHER AVIONICS
TRANSPONDER OR OTHER AVIONICS
GPS/NAV/COM OR OTHER AVIONICS
A
FRONT VIEW - RADIO PANEL
FASTEN ANGLE WITH RIVETS MS20426A-
ALUMINUM 2024-T3 PER AMS 4037 & AMS QQ-A-250/4 ANGLE, 0.063 X 0.75 X 0.063" BOTH SIDES
ATTACH TO EXISTING STRUCTURE IF AVAILABLE
INSTRUMENT OR RADIO PANEL
TAIL BRACE (TYPICAL) 2024-T3 ALUMINUM PER AMS 4037 & AMS QQ-A-250/4 FLAT 0.75 MIN x 0.032 MIN BOTH SIDES
SPACE TRAYS BY 0.05
#6-32 FLAT HEAD SCREWS AN510 3 PLACES, BOTH SIDES
AFT FACING PLANE OF PANEL
6.25
MOMENT
WT =7.2 LBS
2-WAY DATALINK ANTENNA
VIDEO INPUT (NOT SUPPORTED - SHOWN FOR REFERENCE ONLY)
SPACE TRAYS BY 0.05
A - A
SIDE VIEW - MFD IN TRAY
NOTES:
1. DIMENSIONS IN INCHES.
2 WEIGHT AND MOMENT FOR MFD, TRAY, AND CONNECTORS.
3. REAR SUPPORT STRUCTURE REQUIRED.
AVIDYNE
EX500 INSTALLATION MECHANICAL PANEL, TRAY SUPPORT STRUCTURE

Figure 32: EX500 Tray Support Structure Panel

Appendix E: ORBCOMM Two-Way Datalink Antenna Installation (EX500 Only)



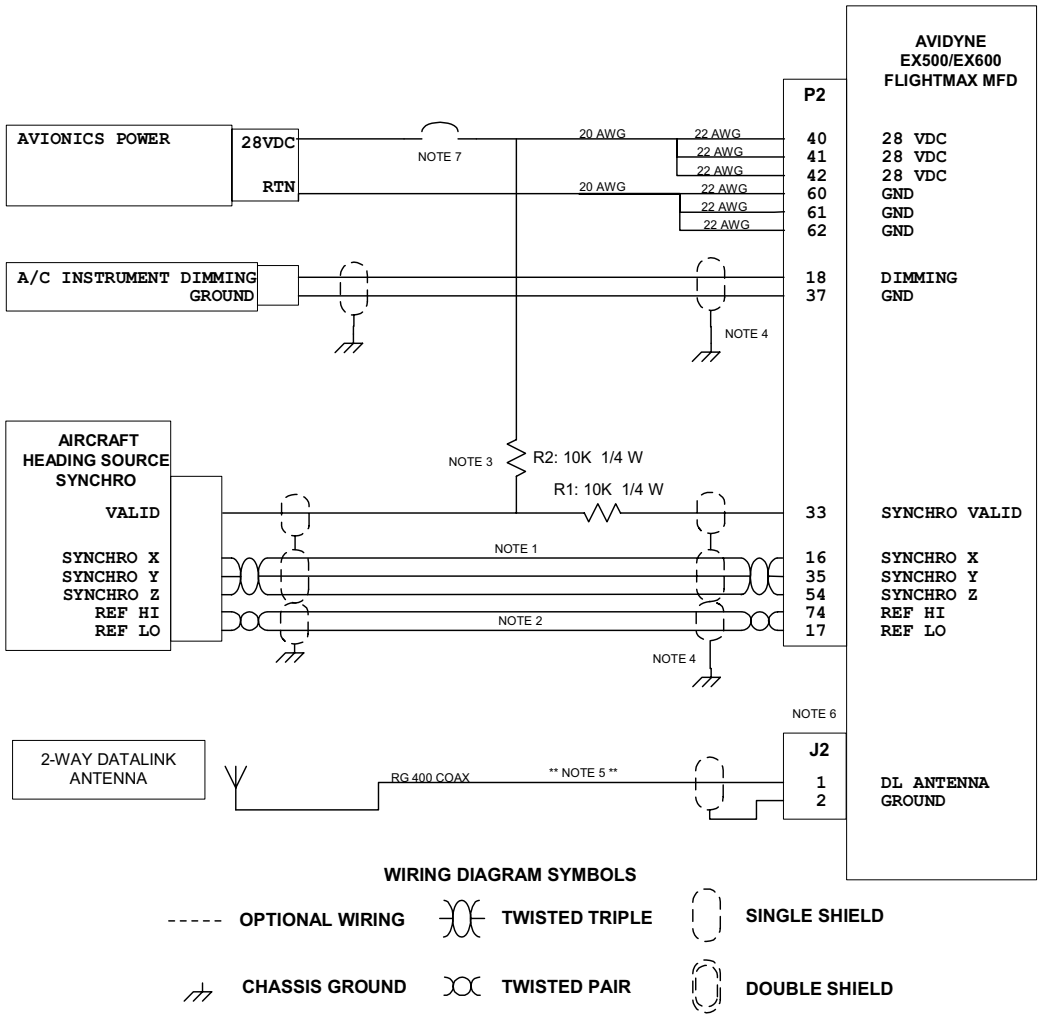
NOTES:

1. ANTENNA: COMANT 177-4 (250 KNOTS) OR COMANT 248-30 (350 KNOTS).
2. INSTALL IN ACCORDANCE WITH AC 43.13, ANTENNA MFG GUIDANCE, AND TSO STANDARDS.
3. ANTENNA LOCATION: TOP OF AIRCRAFT. DISTANCE FROM TRANSMITTING ANTENNA: 36 IN. MIN. DISTANCE FROM VERTICAL STABILIZER: 36 IN. MIN. ALLOWABLE HEIGHT OF VERTICAL STRAKE NEXT TO ANTENNA BASE: 2 IN MAX.
4. GROUND PLANE REQUIRED, 12 RADIUS MIN FOR NON METALLIC FUSELAGE.
5. ANTENNA DOUBLER PLATE FOR ALUMINUM FUSELAGE TYPICAL. DOUBLER SPANNING 2 STRINGERS, 0.125 MIN. DIA. RIVET SPACED 1.5 ON ALL EDGES OF DOUBLER. PREP AND COAT WITH CONDUCTIVE CHROMATE OR ALIDYNE.
6. ANTENNA GROUND CONNECTION MADE VIA INSIDE SURFACE OF FASTENER COUNTERSINK. REMOVE PAINT FROM COUNTERSINK SURFACES AND COAT WITH CONDUCTIVE SEALANT OR INSTALL COUNTERSUNK LOCK WASHERS PER MFG GUIDANCE.
7. MOUNTING HARDWARE: TORQUE EVENLY. SEAL EXPOSED SURFACE AND COUNTERSINK SURFACE.
8. RESISTANCE: ANTENNA GROUND TO MOUNTING HARDWARE TO DOUBLER TO AIRFRAME/GROUND PLANE MAX < 0.5 OHM
9. ANTENNA CABLE: RG-400/U COAX, STRANDED CORE. ROUTE COAX ANTENNA CABLE TO MFD WITH NO KINKS OR BENDS GREATER THAN 2 IN. RADIUS. SECURE ALONG LENGTH, AVOID CHAFING.
10. FIBER REINFORCED PLASTIC (COMPOSITE) FUSELAGE INSTALLATION ONLY IN ACCORDANCE WITH AIRFRAME MFG GUIDANCE, APPROPRIATE SIMILAR STC BASIS, OR DER APPROVAL.
11. AIRCRAFT PRESSURE VESSEL INSTALLATION ONLY IN ACCORDANCE WITH AIRFRAME MFG GUIDANCE, APPROPRIATE SIMILAR STC BASIS, OR DER APPROVAL.
12. ANTENNA SPECIFICATIONS: FREQUENCY:137-151 MHz,
    VSWR: 2.0 to 1 MAX, IMPEDANCE: 50 OHM,
    POLARIZATION PATTERN: VERTICAL OMNI-DIRECTIONAL,
    TERMINATION:DC SHORT (ONLY) BETWEEN CENTER CONDUCTOR AND SHIELD
    RF POWER: 5 W, HEIGHT:18 IN MAX,
    TSO C37d, C38d,
    RTCA/DO-160c, ENV.CAT. D2-AC SXSXDFSXXXXXXXXXX

AVIDYNE CORPORATION
EX500 INSTALLATION MECHANICAL DATA LINK ANTENNA

Figure 33: Installing the 2-Way Datalink Antenna

Appendix F: EX500/EX600 General Wiring



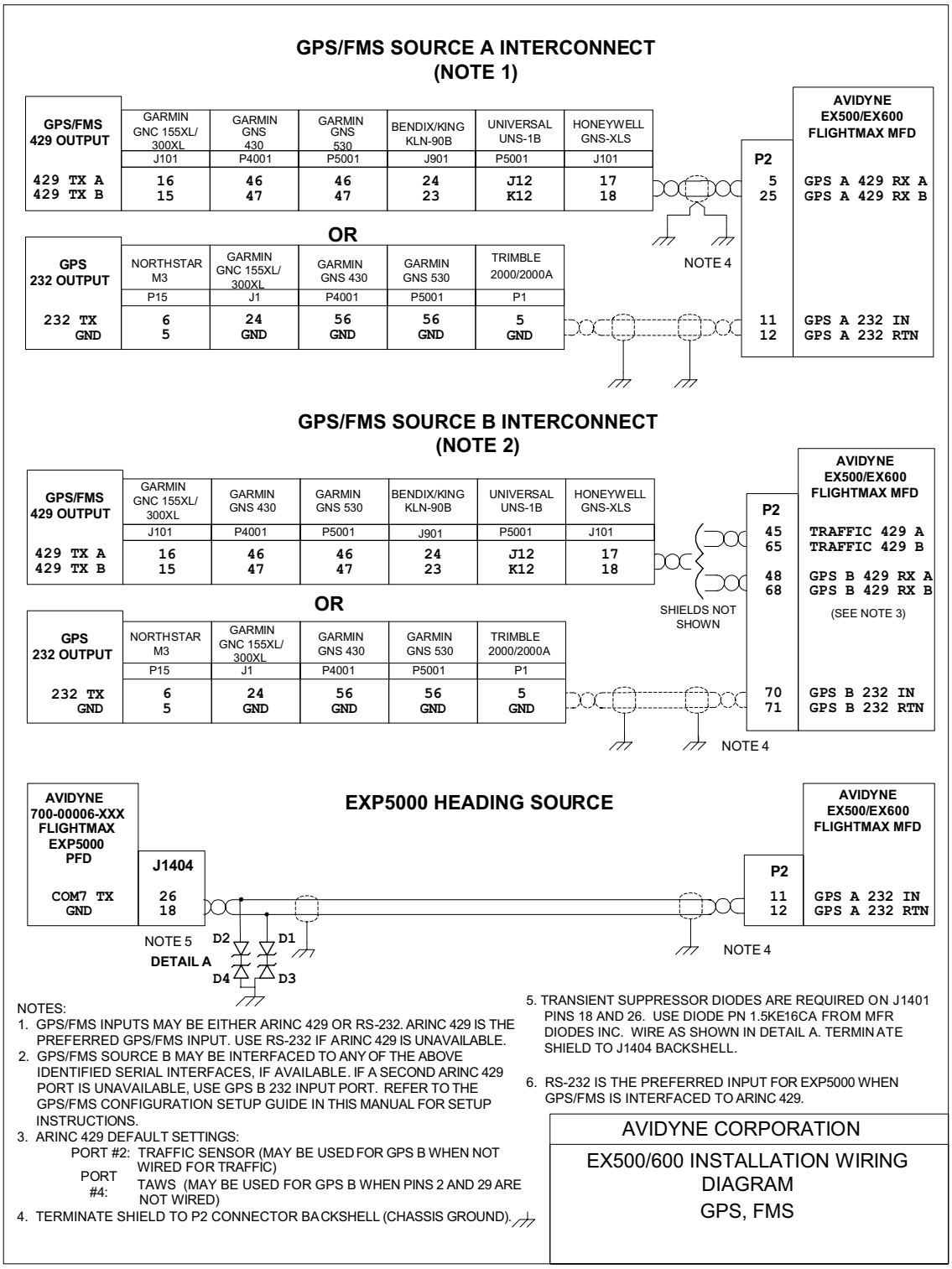
NOTES:
1. THE SYNCHRO HEADING SOURCE IS THE PREFERRED EX500/600 HEADING REFERENCE. THE UNIT WILL ALSO ACCEPT HEADING INFORMATION IF SUPPLIED FROM CERTAIN FMS, TRAFFIC AND LIGHTNING DETECTION SOURCES.
2. SIGNALS: REFERENCE HI AND LO SUPPLIED BY EXTERNAL SOURCE (HEADING SOURCE OR A/C SUPPLY). 26 VAC RMS @ 400HZ, X/Y/Z SIGNAL INPUTS = 11.8 VAC RMS SUPPLIED BY HEADING SOURCE. REFERENCE AND SIGNAL INPUT WAVEFORMS MUST BE IDENTICAL, E.I. EITHER BOTH SINE WAVES OR BOTH SQUARE WAVES.
3. WHEN USING SYNCHRO FOR THE HEADING SOURCE, INSTALL RESISTORS WHEN REQUIRED AS FOLLOWS:
   R1: SYNCHRO SOURCE HAS "VALID" OUTPUT SIGNAL AVAILABLE,
   R2: SYNCHRO SOURCE "VALID" SIGNAL WIRED TO THE EX500/600 ONLY.
4. TERMINATE SHIELD TO P2 CONNECTOR BACKSHELL (CHASSIS GROUND).
5. ** TO MINIMIZE POSSIBLE INTERFERENCE, THE DATALINK ANTENNA CABLE SHOULD BE ROUTED AS TO AVOID CLOSE PROXIMITY WITH OTHER SENSITIVE AVIOINCS SYSTEM. ADDITIONAL CABLE SHIELDING MAY REDUCE ANY DETECTED SYSTEM INTERFERENCE. **
6. 700-00007-70X, 700-00007-80X AND EX600 MFDs DO NOT HAVE AN INTERNAL 2-WAY DATALINK SYSTEM
7. REFERENCE FAA AC 43.13-( ) FOR THE APPROPRIATE WIRE AND CIRCUIT BREAKER SIZE. 7.5A CIRCUIT BREAKER FOR THE EX500 OR A 5A CIRCUIT BREAKER FOR THE EX600 IS RECOMMENDED.

AVIDYNE CORPORATION

INSTALLATION WIRING DIAGRAM
GENERAL EX500/600 WIRING

Figure 34: EX500/EX600 General Wiring

Appendix G: GPS/FMS System Wiring



NOTES:
1. GPS/FMS INPUTS MAY BE EITHER ARINC 429 OR RS-232. ARINC 429 IS THE PREFERRED GPS/FMS INPUT. USE RS-232 IF ARINC 429 IS UNAVAILABLE.
2. GPS/FMS SOURCE B MAY BE INTERFACED TO ANY OF THE ABOVE IDENTIFIED SERIAL INTERFACES, IF AVAILABLE. IF A SECOND ARINC 429 PORT IS UNAVAILABLE, USE GPS B 232 INPUT PORT. REFER TO THE GPS/FMS CONFIGURATION SETUP GUIDE IN THIS MANUAL FOR SETUP INSTRUCTIONS.
3. ARINC 429 DEFAULT SETTINGS:
   PORT #2: TRAFFIC SENSOR (MAY BE USED FOR GPS B WHEN NOT WIRED FOR TRAFFIC)
   PORT #4: TAWS (MAY BE USED FOR GPS B WHEN PINS 2 AND 29 ARE NOT WIRED)
4. TERMINATE SHIELD TO P2 CONNECTOR BACKSHELL (CHASSIS GROUND).
5. TRANSIENT SUPPRESSOR DIODES ARE REQUIRED ON J1401 PINS 18 AND 26. USE DIODE PN 1.5KE16CA FROM MFR DIODES INC. WIRE AS SHOWN IN DETAIL A. TERMINATE SHIELD TO J1404 BACKSHELL.
6. RS-232 IS THE PREFERRED INPUT FOR EXP5000 WHEN GPS/FMS IS INTERFACED TO ARINC 429.

AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM GPS, FMS

Figure 35: GPS/FMS Sub-System Wiring

Appendix H: Lightning and Datalink Sensor Wiring

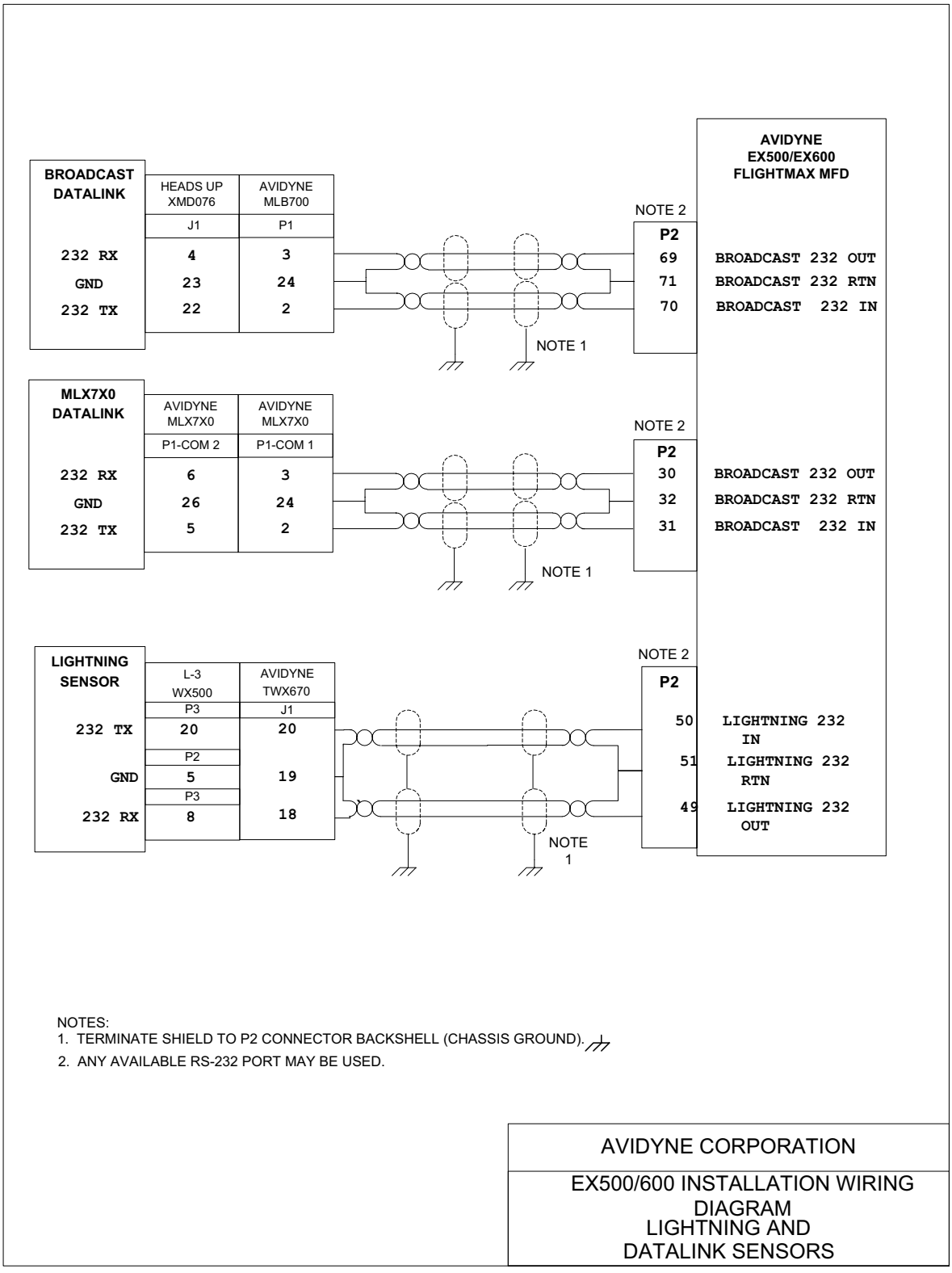


Figure 36: Lightning and Datalink Sensor Wiring

Appendix I: Traffic Sensor Wiring

I.1 TAS, TCAD, TCAS, and TIS Wiring

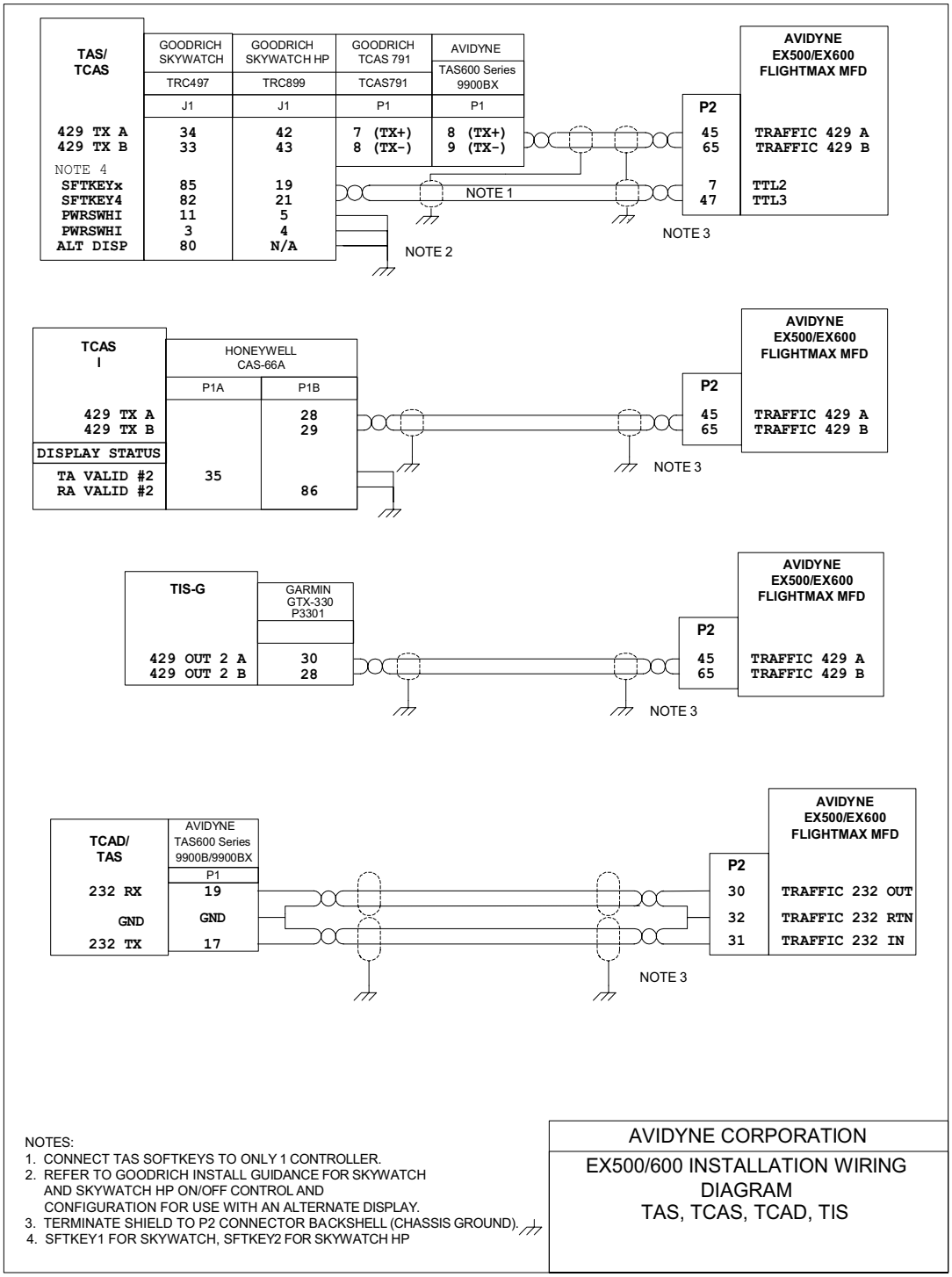


Figure 37: Traffic Wiring: TAS, TCAS, TCAD, TIS

I.2 Traffic/TAWS Sensors Wiring

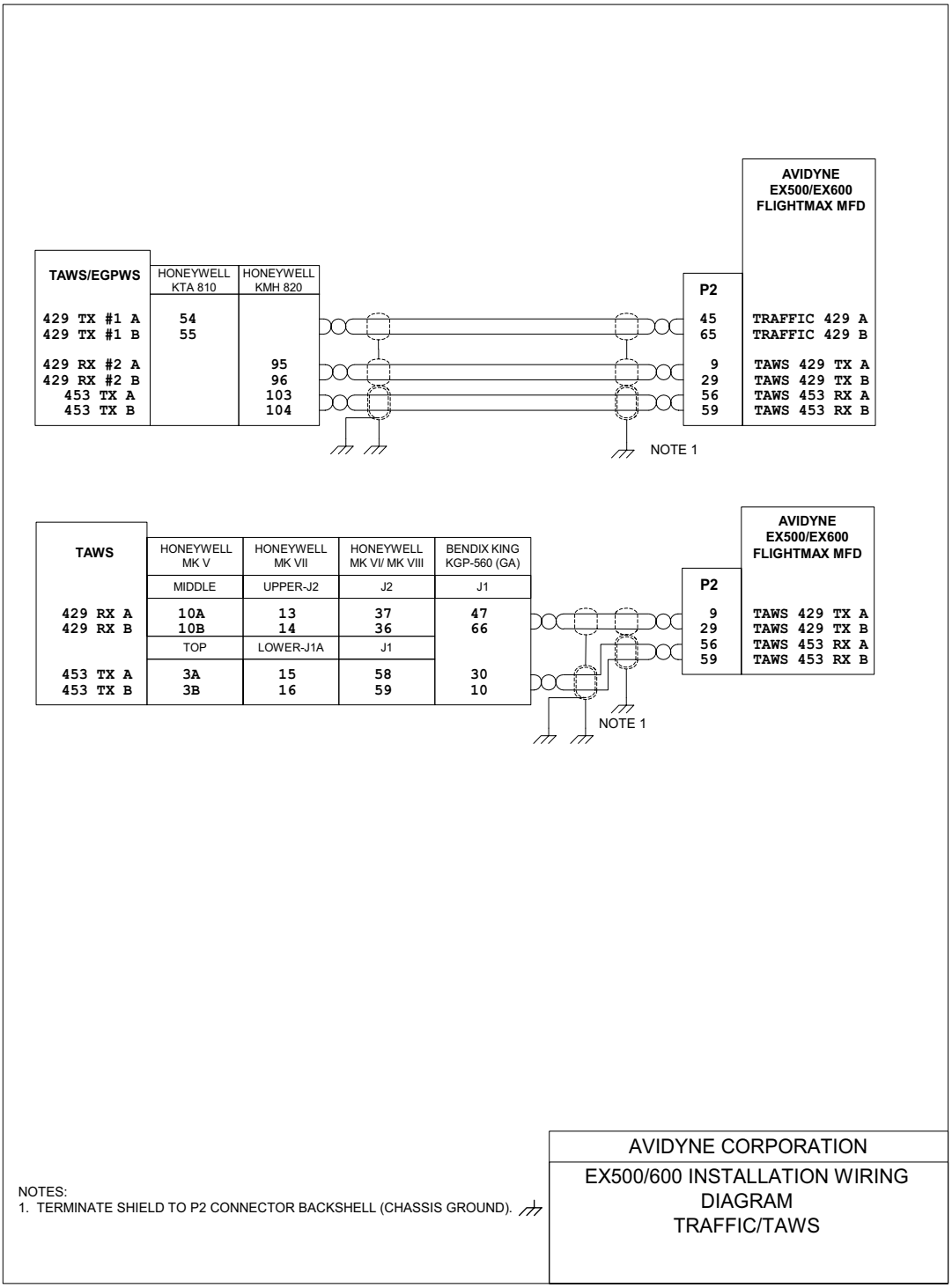

AVIDYNE
EX500/EX600
FLIGHTMAX MFD
TAWS/EGPWS
HONEYWELL KTA 810
HONEYWELL KMH 820
P2
429 TX #1 A 54 45 TRAFFIC 429 A
429 TX #1 B 55 65 TRAFFIC 429 B
429 RX #2 A 95 9 TAWS 429 TX A
429 RX #2 B 96 29 TAWS 429 TX B
453 TX A 103 56 TAWS 453 RX A
453 TX B 104 59 TAWS 453 RX B
NOTE 1
AVIDYNE
EX500/EX600
FLIGHTMAX MFD
TAWS
HONEYWELL MK V
HONEYWELL MK VII
HONEYWELL MK VI/ MK VIII
BENDIX KING KGP-560 (GA)
MIDDLE
UPPER-J2
J2
J1
P2
429 RX A 10A 13 37 47 9 TAWS 429 TX A
429 RX B 10B 14 36 66 29 TAWS 429 TX B
TOP
LOWER-J1A
J1
56 TAWS 453 RX A
453 TX A 3A 15 58 30 59 TAWS 453 RX B
453 TX B 3B 16 59 10
NOTE 1
NOTES:
1. TERMINATE SHIELD TO P2 CONNECTOR BACKSHELL (CHASSIS GROUND).
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
TRAFFIC/TAWS

Figure 38: Traffic/TAWS Wiring

Appendix J: Radar Wiring

J.1 Digital Radar Wiring

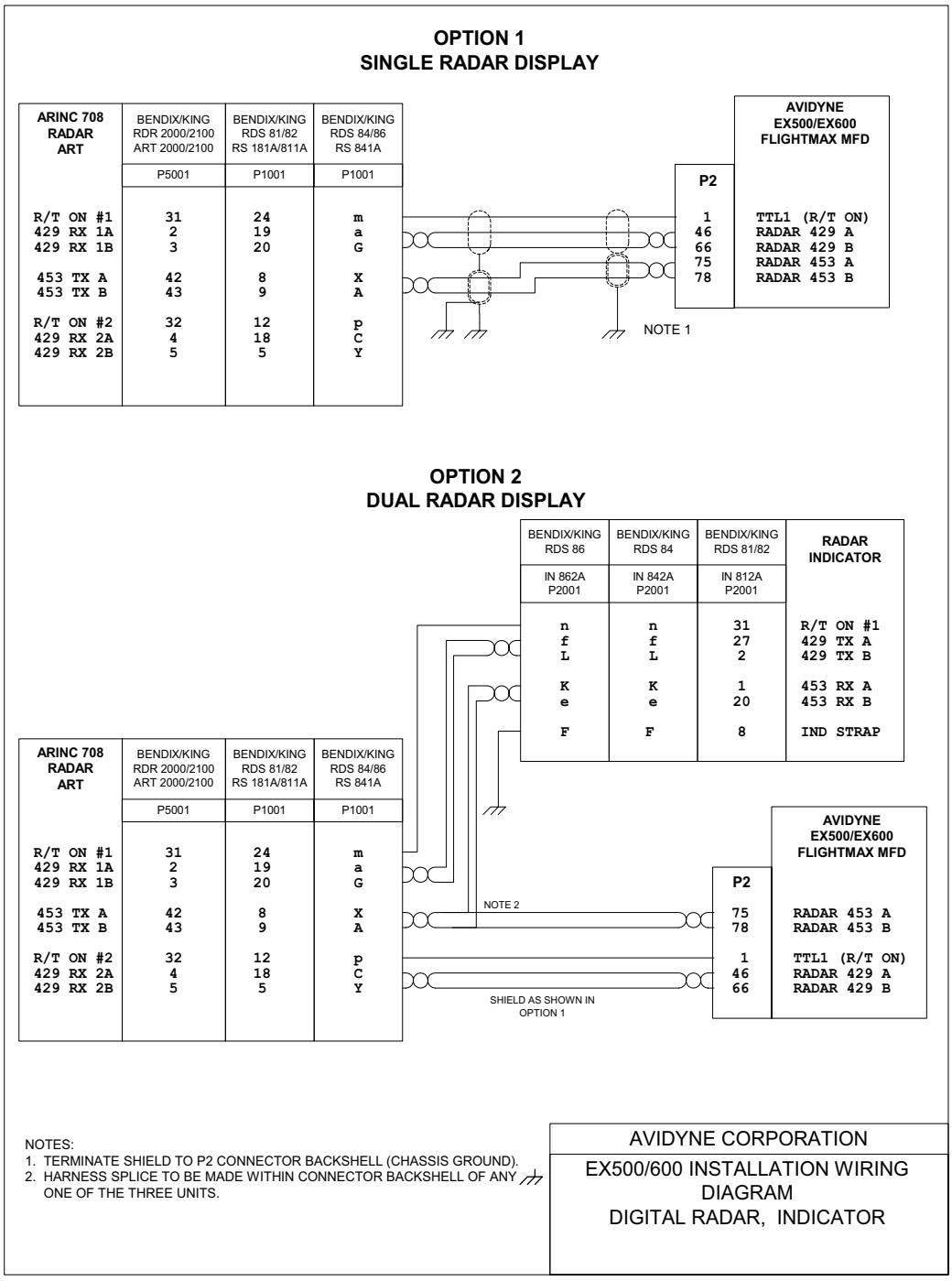

OPTION 1
SINGLE RADAR DISPLAY
ARINC 708 RADAR ART
BENDIX/KING RDR 2000/2100 ART 2000/2100
BENDIX/KING RDS 81/82 RS 181A/811A
BENDIX/KING RDS 84/86 RS 841A
P5001
P1001
P1001
R/T ON #1 31 24 m
429 RX 1A 2 19 a
429 RX 1B 3 20 G
453 TX A 42 8 X
453 TX B 43 9 A
R/T ON #2 32 12 p
429 RX 2A 4 18 C
429 RX 2B 5 5 Y
AVIDYNE EX500/EX600 FLIGHTMAX MFD
P2
1 TTL1 (R/T ON)
46 RADAR 429 A
66 RADAR 429 B
75 RADAR 453 A
78 RADAR 453 B
NOTE 1
OPTION 2
DUAL RADAR DISPLAY
BENDIX/KING RDS 86
BENDIX/KING RDS 84
BENDIX/KING RDS 81/82
RADAR INDICATOR
IN 862A P2001
IN 842A P2001
IN 812A P2001
n n 31 R/T ON #1
f f 27 429 TX A
L L 2 429 TX B
K K 1 453 RX A
e e 20 453 RX B
F F 8 IND STRAP
ARINC 708 RADAR ART
BENDIX/KING RDR 2000/2100 ART 2000/2100
BENDIX/KING RDS 81/82 RS 181A/811A
BENDIX/KING RDS 84/86 RS 841A
P5001
P1001
P1001
R/T ON #1 31 24 m
429 RX 1A 2 19 a
429 RX 1B 3 20 G
453 TX A 42 8 X
453 TX B 43 9 A
R/T ON #2 32 12 p
429 RX 2A 4 18 C
429 RX 2B 5 5 Y
AVIDYNE EX500/EX600 FLIGHTMAX MFD
P2
75 RADAR 453 A
78 RADAR 453 B
1 TTL1 (R/T ON)
46 RADAR 429 A
66 RADAR 429 B
NOTE 2
SHIELD AS SHOWN IN OPTION 1
NOTES:
1. TERMINATE SHIELD TO P2 CONNECTOR BACKSHELL (CHASSIS GROUND).
2. HARNESS SPLICE TO BE MADE WITHIN CONNECTOR BACKSHELL OF ANY ONE OF THE THREE UNITS.
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
DIGITAL RADAR, INDICATOR

Figure 39: Digital Radar Wiring

J.2 RDR-130/150/160 RADAR Direct Connect Wiring

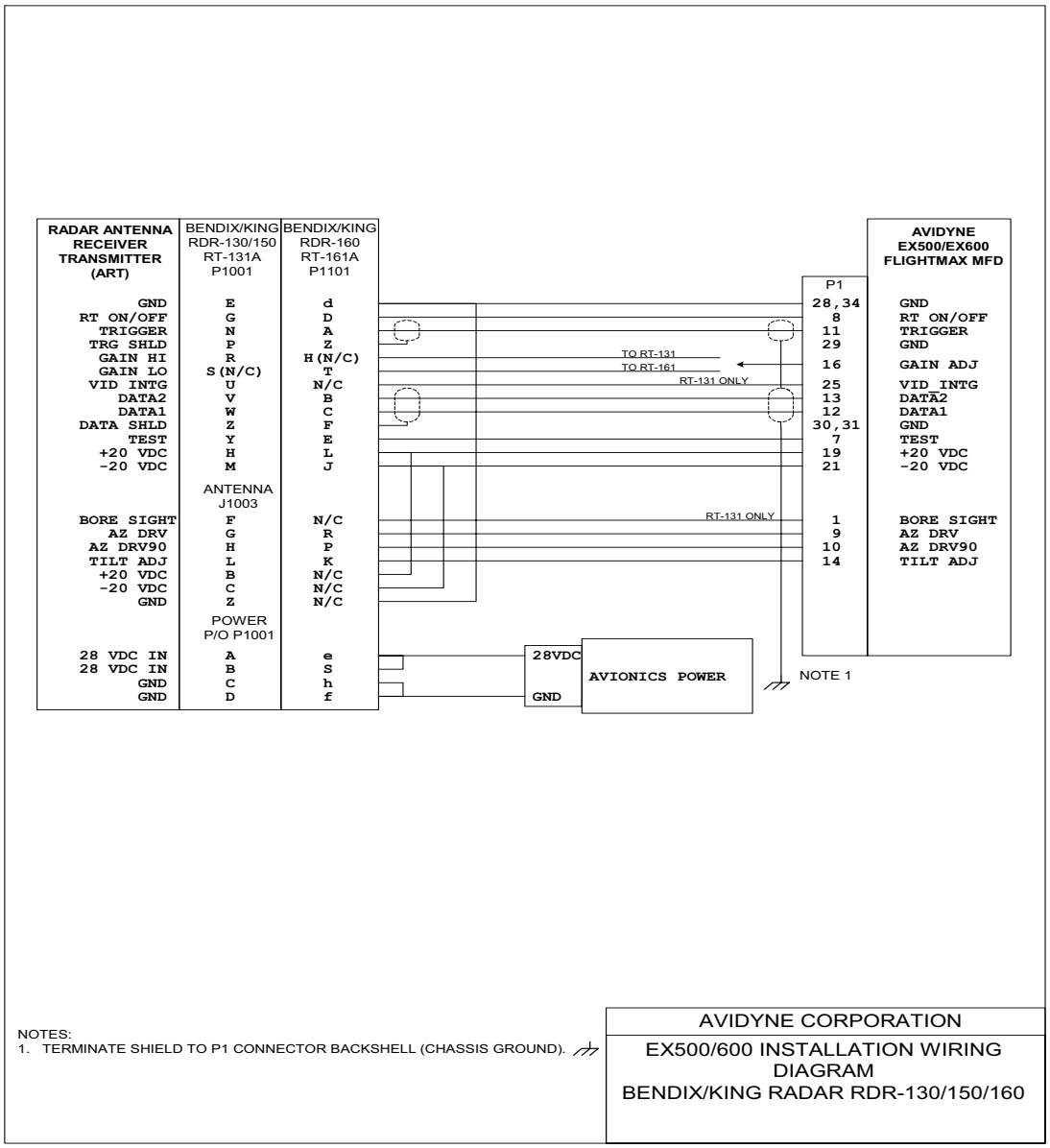

RADAR ANTENNA RECEIVER TRANSMITTER (ART)
BENDIX/KING RDR-130/150 RT-131A P1001
BENDIX/KING RDR-160 RT-161A P1101
AVIDYNE EX500/EX600 FLIGHTMAX MFD
P1
GND E d 28,34 GND
RT ON/OFF G D 8 RT ON/OFF
TRIGGER N A 11 TRIGGER
TRG SHLD P Z 29 GND
GAIN HI R H(N/C)
GAIN LO S(N/C) T 16 GAIN ADJ
VID INTG U N/C 25 VID_INTG
DATA2 V B 13 DATA2
DATA1 W C 12 DATA1
DATA SHLD Z F 30,31 GND
TEST Y E 7 TEST
+20 VDC H L 19 +20 VDC
-20 VDC M J 21 -20 VDC
TO RT-131
TO RT-161
RT-131 ONLY
ANTENNA J1003
BORE SIGHT F N/C 1 BORE SIGHT
AZ DRV G R 9 AZ DRV
AZ DRV90 H P 10 AZ DRV90
TILT ADJ L K 14 TILT ADJ
+20 VDC B N/C
-20 VDC C N/C
GND Z N/C
RT-131 ONLY
POWER P/O P1001
28 VDC IN A e
28 VDC IN B S
GND C h
GND D f
28VDC
GND
AVIONICS POWER
NOTE 1
NOTES:
1. TERMINATE SHIELD TO P1 CONNECTOR BACKSHELL (CHASSIS GROUND).
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
BENDIX/KING RADAR RDR-130/150/160

Figure 40: RDR-130/150/160 RADAR Direct Connect Wiring

J.3 RDR-130/150/160 RADAR w/Adaptor Cable Wiring

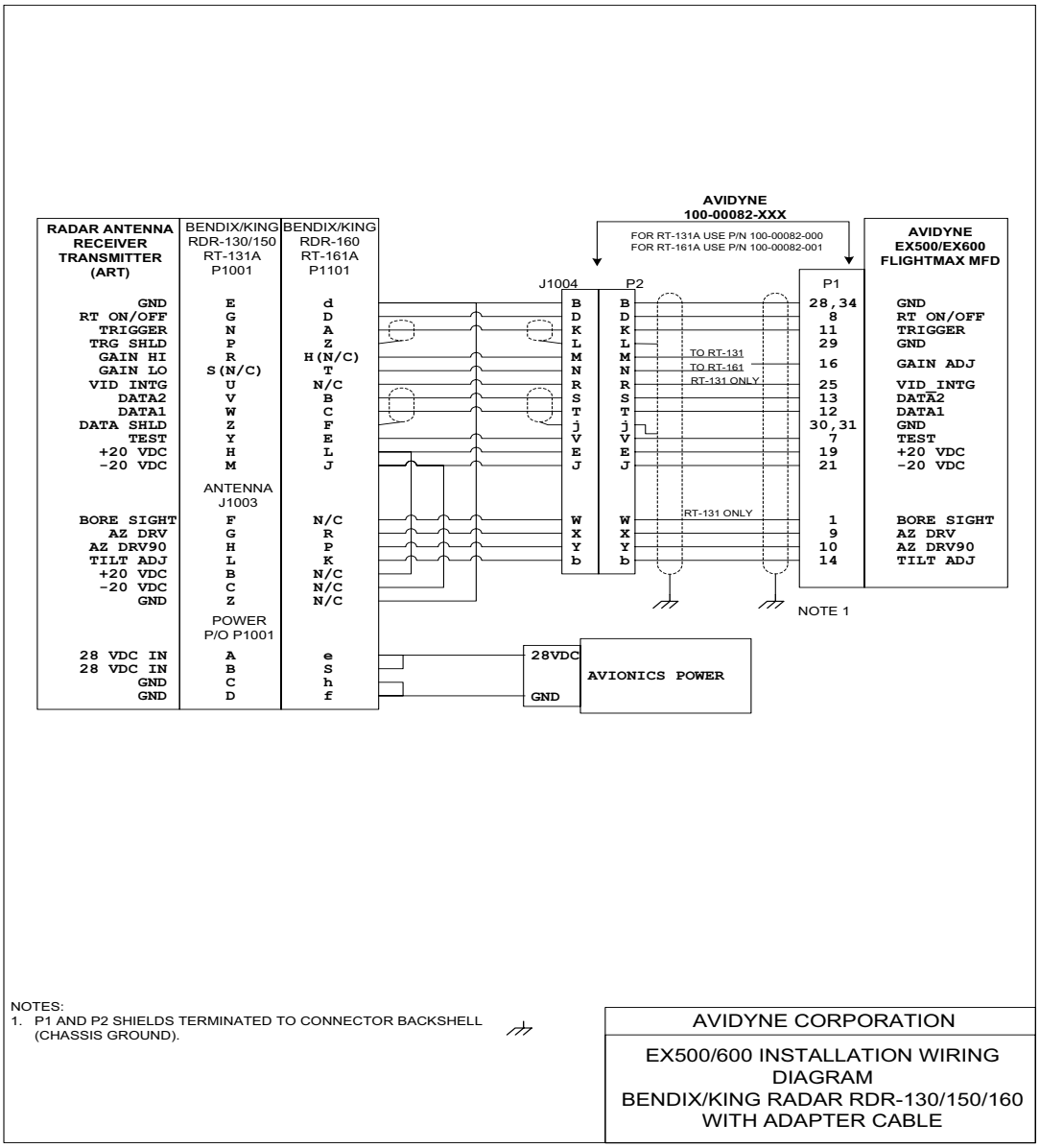

AVIDYNE
100-00082-XXX
FOR RT-131A USE P/N 100-00082-000
FOR RT-161A USE P/N 100-00082-001
RADAR ANTENNA RECEIVER TRANSMITTER (ART)
BENDIX/KING RDR-130/150 RT-131A P1001
BENDIX/KING RDR-160 RT-161A P1101
AVIDYNE EX500/EX600 FLIGHTMAX MFD
J1004
P2
P1
GND E d GND 28,34
RT ON/OFF G D RT ON/OFF 8
TRIGGER N A TRIGGER 11
TRG SHLD P Z GND 29
GAIN HI R H(N/C) GAIN ADJ 16
GAIN LO S(N/C) T
VID INTG U N/C VID_INTG 25
DATA2 V B DATA2 13
DATA1 W C DATA1 12
DATA SHLD Z F GND 30,31
TEST Y E TEST 7
+20 VDC H L +20 VDC 19
-20 VDC M J -20 VDC 21
TO RT-131
TO RT-161
RT-131 ONLY
ANTENNA J1003
BORE SIGHT F N/C BORE SIGHT 1
AZ DRV G R AZ DRV 9
AZ DRV90 H P AZ DRV90 10
TILT ADJ L K TILT ADJ 14
+20 VDC B N/C
-20 VDC C N/C
GND Z N/C
RT-131 ONLY
NOTE 1
POWER P/O P1001
28 VDC IN A e
28 VDC IN B S
GND C h
GND D f
28VDC
GND
AVIONICS POWER
NOTES:
1. P1 AND P2 SHIELDS TERMINATED TO CONNECTOR BACKSHELL (CHASSIS GROUND).
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
BENDIX/KING RADAR RDR-130/150/160 WITH ADAPTER CABLE

Figure 41: RDR-130/150/160 RADAR w/Adaptor Cable Wiring

J.4 RDR-1100/1200 RADAR Direct Connect Wiring

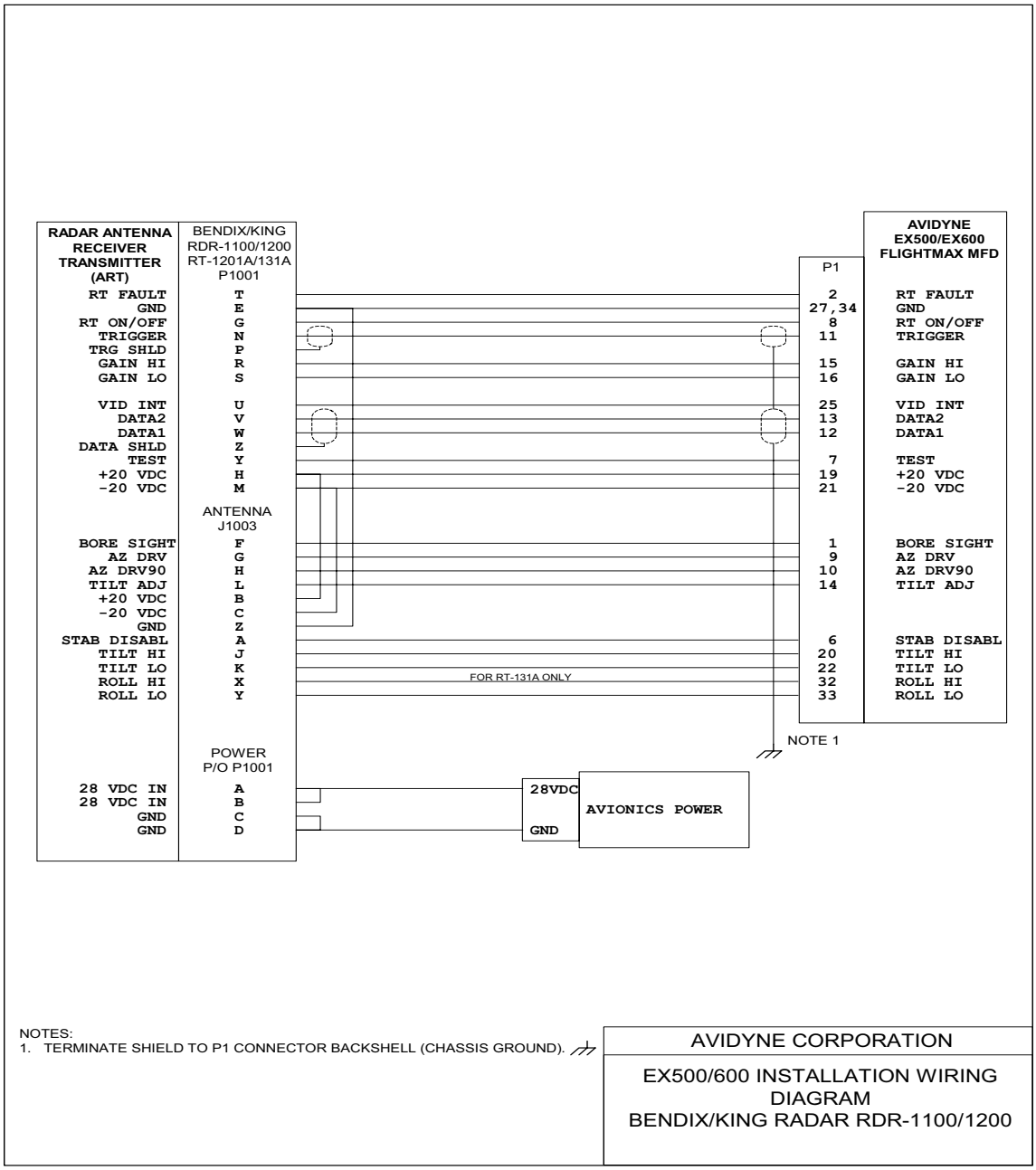


Figure 42: RDR-1100/1200 RADAR Direct Connect Wiring

J.5 RDR-1100/1200 RADAR w/ Adaptor Cable Wiring

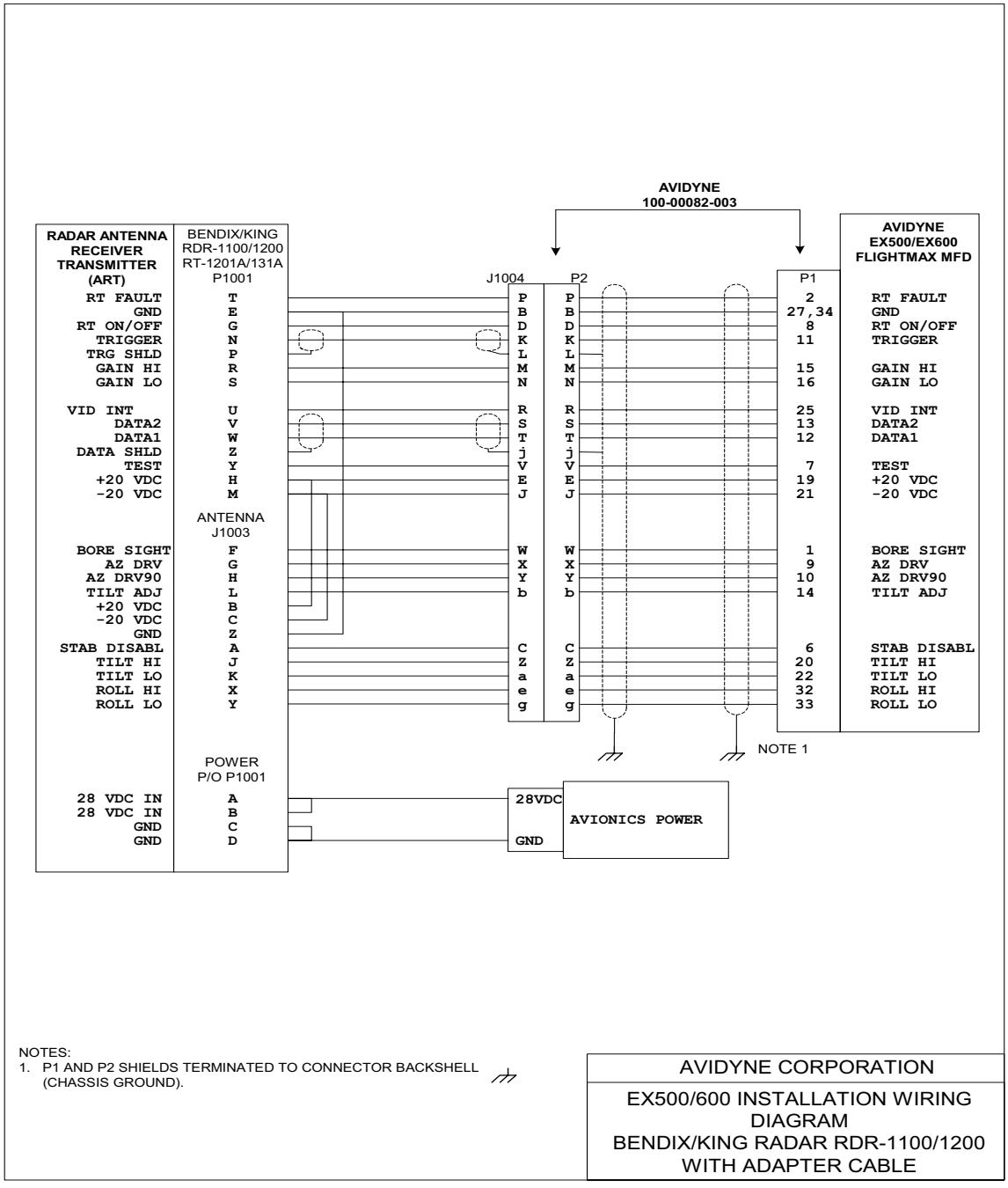

AVIDYNE
100-00082-003
RADAR ANTENNA RECEIVER TRANSMITTER (ART)
BENDIX/KING RDR-1100/1200 RT-1201A/131A P1001
J1004
P2
P1
AVIDYNE EX500/EX600 FLIGHTMAX MFD
RT FAULT T P P 2 RT FAULT
GND E B B 27,34 GND
RT ON/OFF G D D 8 RT ON/OFF
TRIGGER N K K 11 TRIGGER
TRG SHLD P L L
GAIN HI R M M 15 GAIN HI
GAIN LO S N N 16 GAIN LO
VID INT U R R 25 VID INT
DATA2 V S S 13 DATA2
DATA1 W T T 12 DATA1
DATA SHLD Z j j
TEST Y V V 7 TEST
+20 VDC H E E 19 +20 VDC
-20 VDC M J J 21 -20 VDC
ANTENNA J1003
BORE SIGHT F W W 1 BORE SIGHT
AZ DRV G X X 9 AZ DRV
AZ DRV90 H Y Y 10 AZ DRV90
TILT ADJ L b b 14 TILT ADJ
+20 VDC B
-20 VDC C
GND Z
STAB DISABL A C C 6 STAB DISABL
TILT HI J Z Z 20 TILT HI
TILT LO K a a 22 TILT LO
ROLL HI X e e 32 ROLL HI
ROLL LO Y g g 33 ROLL LO
NOTE 1
POWER P/O P1001
28 VDC IN A
28 VDC IN B
GND C
GND D
28VDC
GND
AVIONICS POWER
NOTES:
1. P1 AND P2 SHIELDS TERMINATED TO CONNECTOR BACKSHELL (CHASSIS GROUND).
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
BENDIX/KING RADAR RDR-1100/1200 WITH ADAPTER CABLE

Figure 43: RDR-1100/1200 RADAR w/Adaptor Cable Wiring

J.6 RDR-1300 RADAR Direct Connect Wiring

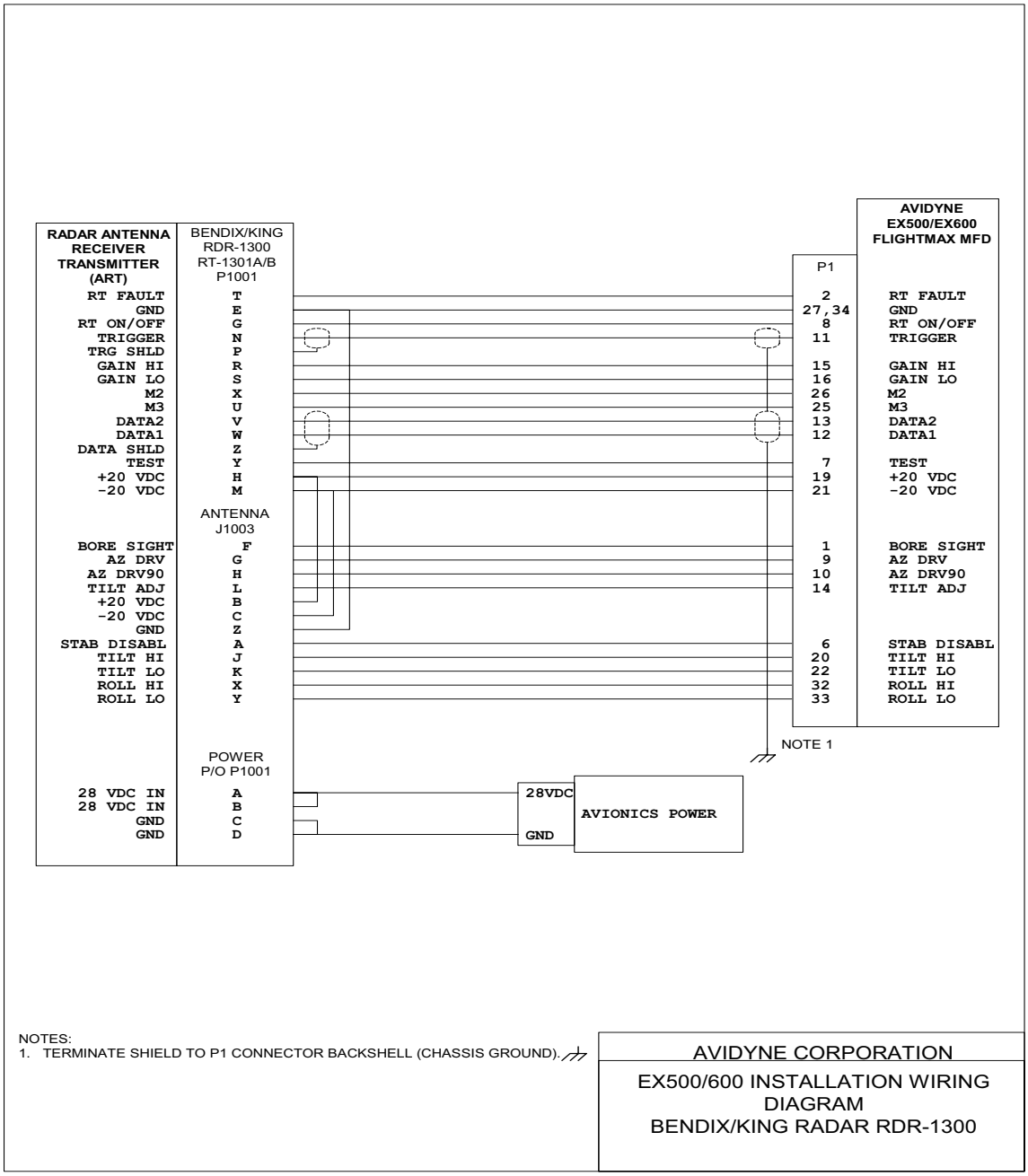

RADAR ANTENNA RECEIVER TRANSMITTER (ART)
BENDIX/KING RDR-1300 RT-1301A/B P1001
AVIDYNE EX500/EX600 FLIGHTMAX MFD
P1
RT FAULT T 2 RT FAULT
GND E 27,34 GND
RT ON/OFF G 8 RT ON/OFF
TRIGGER N 11 TRIGGER
TRG SHLD P
GAIN HI R 15 GAIN HI
GAIN LO S 16 GAIN LO
M2 X 26 M2
M3 U 25 M3
DATA2 V 13 DATA2
DATA1 W 12 DATA1
DATA SHLD Z
TEST Y 7 TEST
+20 VDC H 19 +20 VDC
-20 VDC M 21 -20 VDC
ANTENNA J1003
BORE SIGHT F 1 BORE SIGHT
AZ DRV G 9 AZ DRV
AZ DRV90 H 10 AZ DRV90
TILT ADJ L 14 TILT ADJ
+20 VDC B
-20 VDC C
GND Z
STAB DISABL A 6 STAB DISABL
TILT HI J 20 TILT HI
TILT LO K 22 TILT LO
ROLL HI X 32 ROLL HI
ROLL LO Y 33 ROLL LO
NOTE 1
POWER P/O P1001
28 VDC IN A
28 VDC IN B
GND C
GND D
28VDC
GND
AVIONICS POWER
NOTES:
1. TERMINATE SHIELD TO P1 CONNECTOR BACKSHELL (CHASSIS GROUND).
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
BENDIX/KING RADAR RDR-1300

Figure 44: RDR-1300 RADAR Direct Connect Wiring

J.7 RDR-1300 RADAR w/Adaptor Cable Wiring

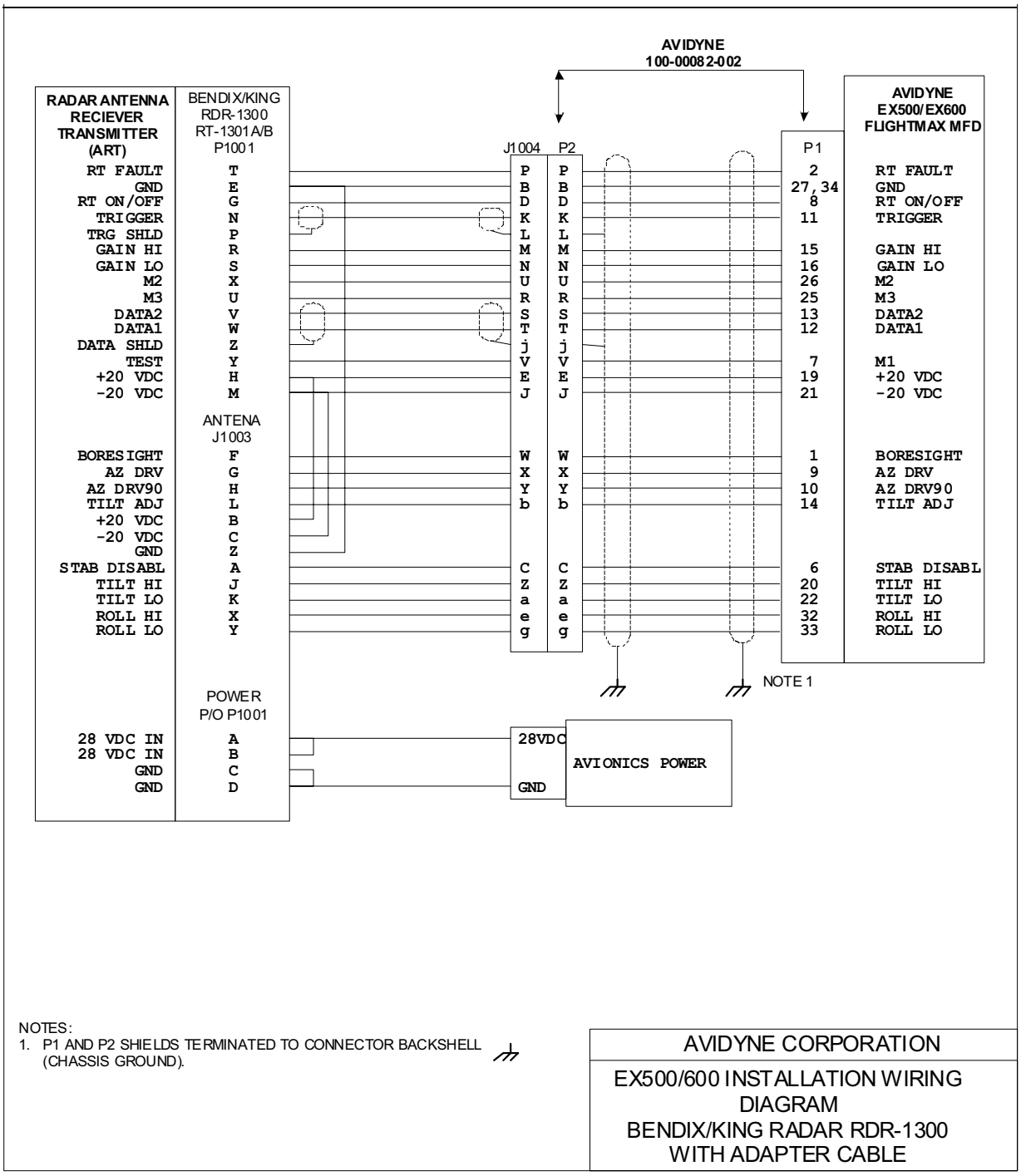

AVIDYNE
100-00082-002
RADAR ANTENNA RECIEVER TRANSMITTER (ART)
BENDIX/KING RDR-1300 RT-1301A/B P1001
J1004
P2
P1
AVIDYNE EX500/EX600 FLIGHTMAX MFD
RT FAULT T P P 2 RT FAULT
GND E B B 27,34 GND
RT ON/OFF G D D 8 RT ON/OFF
TRIGGER N K K 11 TRIGGER
TRG SHLD P L L
GAIN HI R M M 15 GAIN HI
GAIN LO S N N 16 GAIN LO
M2 X U U 26 M2
M3 U R R 25 M3
DATA2 V S S 13 DATA2
DATA1 W T T 12 DATA1
DATA SHLD Z j j
TEST Y V V 7 M1
+20 VDC H E E 19 +20 VDC
-20 VDC M J J 21 -20 VDC
ANTENA J1003
BORESIGHT F W W 1 BORESIGHT
AZ DRV G X X 9 AZ DRV
AZ DRV90 H Y Y 10 AZ DRV90
TILT ADJ L b b 14 TILT ADJ
+20 VDC B
-20 VDC C
GND Z
STAB DISABL A C C 6 STAB DISABL
TILT HI J Z Z 20 TILT HI
TILT LO K a a 22 TILT LO
ROLL HI X e e 32 ROLL HI
ROLL LO Y g g 33 ROLL LO
NOTE 1
POWER P/O P1001
28 VDC IN A
28 VDC IN B
GND C
GND D
28VDC
GND
AVIONICS POWER
NOTES:
1. P1 AND P2 SHIELDS TERMINATED TO CONNECTOR BACKSHELL (CHASSIS GROUND).
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
BENDIX/KING RADAR RDR-1300 WITH ADAPTER CABLE

Figure 45: RDR-1300 RADAR w/Adaptor Cable Wiring

J.8 WXR250/270/300 RADAR w/Adaptor Cable Wiring

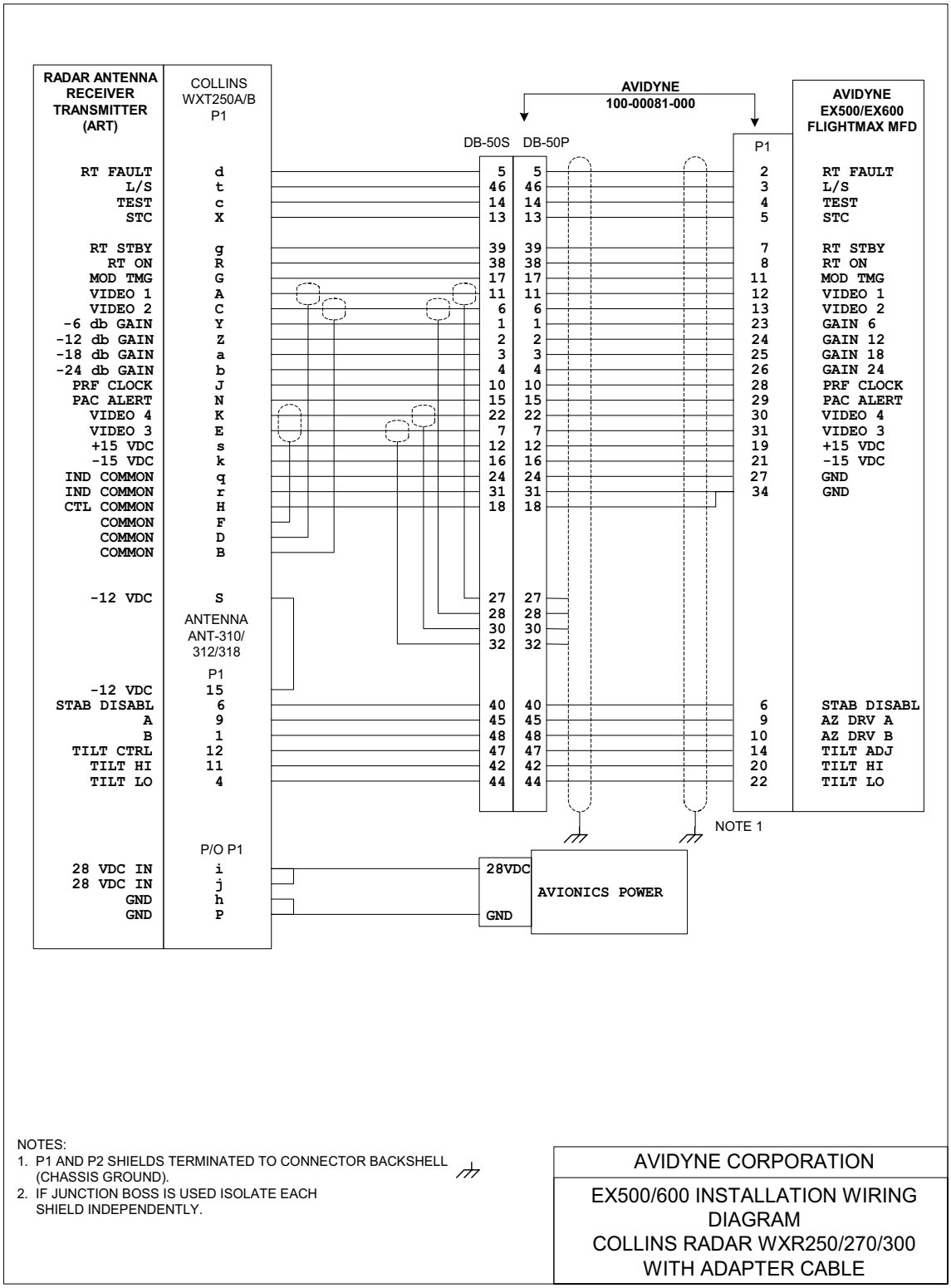

RADAR ANTENNA RECEIVER TRANSMITTER (ART)
COLLINS WXT250A/B P1
AVIDYNE 100-00081-000
DB-50S DB-50P
P1
AVIDYNE EX500/EX600 FLIGHTMAX MFD
RT FAULT d 5 5 2 RT FAULT
L/S t 46 46 3 L/S
TEST c 14 14 4 TEST
STC X 13 13 5 STC
RT STBY g 39 39 7 RT STBY
RT ON R 38 38 8 RT ON
MOD TMG G 17 17 11 MOD TMG
VIDEO 1 A 11 11 12 VIDEO 1
VIDEO 2 C 6 6 13 VIDEO 2
-6 db GAIN Y 1 1 23 GAIN 6
-12 db GAIN Z 2 2 24 GAIN 12
-18 db GAIN a 3 3 25 GAIN 18
-24 db GAIN b 4 4 26 GAIN 24
PRF CLOCK J 10 10 28 PRF CLOCK
PAC ALERT N 15 15 29 PAC ALERT
VIDEO 4 K 22 22 30 VIDEO 4
VIDEO 3 E 7 7 31 VIDEO 3
+15 VDC s 12 12 19 +15 VDC
-15 VDC k 16 16 21 -15 VDC
IND COMMON q 24 24 27 GND
IND COMMON r 31 31 34 GND
CTL COMMON H 18 18
COMMON F
COMMON D
COMMON B
-12 VDC S 27 27
28 28
30 30
32 32
ANTENNA ANT-310/ 312/318
P1
-12 VDC 15
STAB DISABL 6 40 40 6 STAB DISABL
A 9 45 45 9 AZ DRV A
B 1 48 48 10 AZ DRV B
TILT CTRL 12 47 47 14 TILT ADJ
TILT HI 11 42 42 20 TILT HI
TILT LO 4 44 44 22 TILT LO
NOTE 1
P/O P1
28 VDC IN i
28 VDC IN j
GND h
GND P
28VDC
GND
AVIONICS POWER
NOTES:
1. P1 AND P2 SHIELDS TERMINATED TO CONNECTOR BACKSHELL (CHASSIS GROUND).
2. IF JUNCTION BOSS IS USED ISOLATE EACH SHIELD INDEPENDENTLY.
AVIDYNE CORPORATION
EX500/600 INSTALLATION WIRING DIAGRAM
COLLINS RADAR WXR250/270/300 WITH ADAPTER CABLE

Figure 46: WXR250/270/300 RADAR w/ Adaptor Cable Wiring

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781-402-7400

www.avidyne.com

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(c) The Product has not been altered in any manner other than as previously authorized by Avidyne in writing; and

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